

AMERICAN INEMATOGRAPHER

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25c



this issue

Process Shot Economies
Shooting Color Stills
Remote Control for Follow Focus
Rapid Processing Methods
. . . and other features



ANNA KARENINA
 THE HEADLINE WOMAN
 THE EAGLE'S BROOD
 WANDERER OF THE
 WASTELAND
 ACCENT ON YOUTH
 FATHER BROWN, DETECTIVE
 MAN'S BEST FRIEND
 \$20 A WEEK
 SWEEPSTAKE ANNIE
 ONE HOUR LATE
 LIGHTNING STRIKES TWICE
 ROBERTA
 BEHOLD MY WIFE
 VANESSA, HER LOVE STORY
 THE WEDDING NIGHT
 RUGGLES OF RED GAP
 NAUGHTY MARIETTA
 THE MARRIAGE BARGAIN
 THE CASINO MURDER CASE
 PORT OF LOST DREAMS
 PRIVATE WORLDS
 WILDERNESS MAIL
 BEHIND THE GREEN LIGHTS
 McFADDEN'S FLATS
 CYCLONE RANGER
 HIGH SCHOOL GIRL
 LADDIE
 THE WORLD ACCUSES
 ROCKY MOUNTAIN MYSTERY
 THE GHOST WALKS
 STRANGERS ALL
 FOUR HOURS TO KILL
 CIRCLE OF DEATH
 SONS OF STEEL
 RECKLESS
 THE DEVIL IS A WOMAN
 ON PROBATION
 STOLEN HARMONY
 GOIN' TO TOWN
 ONE FRIGHTENED NIGHT
 RESCUE SQUAD
 THE TEXAS RAMBLER
 SUNSET RANGE
 HOT TIP
 NEW ADVENTURES OF
 TARZAN

THE DARK ANGEL
 UNCONQUERED BANDIT
 NO RANSOM
 ENTER MADAME
 ENCHANTED APRIL
 THE NITWITS
 PEOPLE WILL TALK
 ADVENTUROUS KNIGHTS
 KENTUCKY BLUE STREAK
 LADIES CRAVE EXCITEMENT
 SYMPHONY OF LIVING
 CODE OF THE MOUNTED
 KID COURAGEOUS
 THE VANISHING RIDERS
 MEN WITHOUT NAMES
 NOW OR NEVER
 COLLEGE SCANDAL
 MEN OF ACTION
 CIRCUMSTANTIAL EVIDENCE
 RAINBOW'S END
 DANGER AHEAD
 CHINA SEAS
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 CAPTURED IN CHINATOWN
 SMART GIRL
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 TWO FOR TONIGHT
 THE RIDER OF THE LAW
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TWO FOR TONIGHT
 WATERFRONT LADY
 PURSUIT
 TWO-FISTED
 THE MAN ON THE FLYING
 TRAPEZE
 HOT OFF THE PRESS
 I LIVE MY LIFE
 SADDLE ACES
 WHEN A MAN'S A MAN
 HARD ROCK HARRIGAN
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 THE JUDGEMENT BOOK
 CONFIDENTIAL
 THE RIDER OF THE LAW
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Volume 17 FEBRUARY, 1936 Number 2

What to Read

- PROCESS SHOT Economies
Made "Captain Blood" Possible
by Fred W. Jockmon, A.S.C.....48
- SHOOTING Color Stills for Production
by Eugene Robert Richee, A.S.C.....50
- DR. L. M. DIETRICH Passes on.....51
- PROBLEMS Controlling Correct
Photographic Reproduction, Part 3
by Dr. Herbert Meyer, A.S.C.....52
- FOLLOWING Focus by Remote Control
by Wm. Stull, A.S.C.....53
- RAPID Processing Methods
by H. Parker and J. I. Crobatree.....54
- A DISCIPLE of Restraint
by Harry Burdick.....56

Next Month

• You will wait far further installments of the article by Parker and Crobatree on Rapid Processing Methods. This is a thorough treatise on developing film that will give you much information in this one series of articles . . . in fact it covers many related items that have before not been combined under one heading.

• Dr. Meyer will continue with his absorbing series on Controlling Correct Photographic Reproduction.

• There will be an intensely interesting description of creating sound mechanically.



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Above: Just before the miniature rowboats were blown up. Below: Town, rowboat, and ship are all miniatures.

FOR a number of years Warner Bros. Studio officials had wanted to film Rafael Sabatini's novel, "Captain Blood." It was one of the most interesting story properties acquired when Warners took over the old Vitagraph Company; full of swashbuckling action and romance, this famous pirate tale seemed sure to appeal to a public overfed with gangster-films and synthetic sophistication. But one apparently insurmountable obstacle stood in the way: the tremendous expense of filming sea stories. Time after time the project came up for consideration, and with unfailing regularity was wrecked on the reef of dollars and cents. At least three completed shooting scripts were written in hope of finding a way to film the story without calling for a budget that would rival the national debt.

As the book was written, not less than five seventeenth-century ships—frigates, galleons, and so on—would be required. Successive adaptations cut this number down to three, and at last two; but even so the cost of building and using two full-size frigates would be heartbreaking. The most conservative estimate offered at the studio's budget meetings placed the construction cost of two such ships at \$120,000.00. The cost of photographing the scenes could hardly be estimated, for it depends too largely on the vagaries of wind, wave and weather. At best, it would be a lot

"Process-Shot"

of money—more than some studios spend on a whole feature production; at worst, the cost could reach a staggering total. Too often, in filming sea stories, ships have been built and manned, and sent to sea with an expensive cast and technical crew, camera-ships, standby launches, tugs, etc., only to sail up and down the Pacific for six months or more looking for the right weather—while the overhead mounted merrily, to the tune of several thousand dollars per day.

Then there were naval battles, bombardments, and the sinking of at least two ships to consider. These are tricky things to stage; they may photograph satisfactorily, and they may not: you can't tell until you've done it—and there can be no retakes. When Vitagraph made the silent version of "Captain Blood," twelve years ago, they used full-scale ships. One of them—"Blood's" own pirate craft—was sunk to make the climaxing thrill of the picture. In spite of all their preparations, the scenes didn't come off wholly satisfactorily. Nearly two tons of 100% dynamite exploded in the ship. The blast should have sunk her—but it didn't. The ship went down—but not all the way down. Half the dramatic "punch" of the scene was lost, and there was further trouble with the government inspectors, who ruled that the hulk was a menace to navigation. The sinking had to be completed—this time without benefit of cameras. Actually, the government charged the studio for completing the sinking.

Another sequence—one which couldn't be eliminated—called for a gunner aboard the ship to fire on and destroy a fleet of rowboats with the ship's cannon. That was a nice problem in itself: it would be easy enough to blow up one boat with a bit of dynamite, and there are still stunt men who would be willing to man the boat. But with those men in the water, how could you blow up the other boats? Water conducts explosion-shocks amazingly; an explosion that would blow up a rowboat would be enough to break at least the legs of any men in the water within a hundred-foot radius. So you could add to the expense of building a big set for the town of Port Royal and chartering a steamer to carry the company to a distant location for the job, a nice set of hospital bills—if you didn't find yourself with some damage suits on your hands.

Decidedly, all this would run into money—too much money. Adding them to the normal cost of production, anyone could see that the total cost of making the picture would come within speaking distance of the two million dollar mark. And the executives didn't care to spend that much money on the single picture.

Thanks to modern special-process cinematography, "Captain Blood" is now on the screen. "Process-shots" and miniatures took care of all those costly and dangerous sequences. The total cost, including the routine process work that would have been required for the film under any circumstances, was but one-fifth the cost of merely building full scale ships. Comparing this with the estimated cost of merely building two boats (not photographing them), this shows a net saving of nearly \$100,000. This included building three boats (not two!) in miniature, photographing the battles, etc., and sinking one ship. No member of

Economies Made "Captain Blood" Possible

by
Fred W. Jackman, A.S.C.
Director of Scientific Research
Warner Bros.-First National Studios

the troupe got nearer the ocean than a few days of location work baking dramatic scenes at Loguna Beach. No full-scale ships were used: even the town of Port Royal and the island of Virgen Mogra were for the most part in miniature. And no one was hurt in filming the thrill scenes.

The dramatic action laid aboard ship was filmed on one of the stages, where the main deck of the ship was recreated. When the ship was "at sea," ordinary sky backings and process backgrounds took care of the background. When the ship was in port, or battling other ships, the familiar projected-background process was used, the background keys being made in miniature. A relatively small set, built around the studio tank, took care of the few intimate shots of the principals at the town's waterfront. Port Royal was twice bombarded—once by Spanish privateers, and once by a French fleet: but the bombardment was carried out in miniature. Some of the latter scenes, thanks to a combination of miniatures and various composite processes, even showed real people in the village being crushed by the fall of miniature buildings!

There is one scene which shows Lionel Atwill, who plays "Colonel Bishop," getting into a small boat to be rowed out to the captured Spanish frigate. The boat Atwill enters is a real one—but the one which rows out to the ship is, like the ship and the town itself, a miniature.

In the same way, the sequence where the rowboats are blown up was done in miniature. Tiny figures rowed the model boats across a tank toward the miniature frigate. At the proper moment, a miniature cannon was fired from the ship, and a well-timed blast smashed the boat. This would have been very difficult to do in full-scale, and probably would have cost ten or fifteen times as much as our miniature did, without being a bit more effective. As I have pointed out, done in full scale, with real men, this shot would have been very dangerous; as it was, we found it nearly impossible to injure our tiny dummies.

The big battle, in which "Blood," with but one ship, fights the French fleet bombarding Port Royal, is another combination of miniatures with intimate action photographed on the stage. The ships themselves were of course miniatures and projection-background "keys" of them made

the scenes showing the principals aboard "Blood's" ship very convincing. The long-shots of the battle, as well as the bombardment of the town were, of course, done in miniature. This sequence was essentially conventional miniature technique, with special attention paid to camera height, choice of lenses, and camera speeds, to assure a really convincing effect. Half the shortcomings of ordinary ship miniatures may be traced to carelessness on one of these points, especially getting the camera too high. After all, one is trying to reproduce the effect of full-scale action seen from a normal viewpoint; if the camera is placed higher than what would be, relatively, the normal viewpoint for the reduced scale of the miniature, the shot on the screen will look palpably synthetic. Another common fault in ship miniatures is having a superabundance of detail. All that is necessary is to reproduce the detail one would normally see looking at a real ship from the distance represented by the miniature shot. If you are far enough away to take in the whole ship at a glance, you aren't conscious of every rivet, nail, rope and pulley, nor can you count the freckles on the boat's nose. You don't need them in your miniature either!

In this particular case, we developed one idea which made the battle much easier to film. In most miniature battles, the tiny cannons are built permanently into the ship, and fired electrically from an organlike keyboard. After the guns have all been fired, the cameras must stop, and everything waits until the guns are loaded again, which is a time-consuming process. Our guns were interchangeable: when one "take" was finished, all that was necessary was

Continued on page 61



Above: The miniature battle. Below: Bombarding Port Royal. Town and ship are miniature, but real people move along the waterfront.



Shooting Color Stills for Production

by
Eugene Robert Richee, A. S. C.

SOONER OR LATER, the majority of motion picture stills will have to be made in natural color. More and more productions are being filmed in Technicolor. More and more newspapers and magazines are demanding natural-color photographs for their illustrations and covers. Most exhibitors, too, would infinitely prefer color stills for their lobby-displays. Inevitably, then, our stills will eventually be made in color to meet these demands.

Natural-color still photography is no longer an experiment. A glance at the illustrations and ads in any of the "class" magazines will show that. Direct color photographs are being made and used commercially; you can take your choice between glass or film transparencies and paper prints made by any of a half-a-dozen or more processes, and be sure that if the photographic and laboratory technique is good, you will get a good picture.

But there is a great difference between the commercial color-photography now practiced, and the mass-production methods that must be used in turning out motion picture stills. There's a world of difference between the \$3,000 advertising job where one perfect picture constitutes the whole order, and the ordinary major-studio job of a couple of hundred production-stills, each of which gets an order of 30,000 prints! The real problem we in the studios face is

not choosing or developing a color-still process, but adapting the excellent processes already available to our mass-production needs.

The Paramount Studio's still department, under the direction of Harry Cottrell, has for some time been wrestling with this problem. While none of us care to claim that we've reached the final solution, the results have none the less been gratifyingly successful. Our effort has been solely to adapt an established process to the requirements we knew from practical experience in studio still work, must be met.

The process we have been using produces three color-separation negatives at one exposure, using a camera working on much the same principle as the Technicolor three-color cine-camera. In other words, the red and blue separation negatives are made in a bipack, while the green is separate. Printing may be any one of several established paper-print methods. These prints, though beautiful, are far too expensive to be considered for our purpose; a single 8x10 print may cost from \$20 to \$25 or more. Cottrell, therefore, surveyed the field to see if some more suitable method were not available. He found it in photo-lithography. Working from our three separation-negatives, excellent lithographed reproductions can be made at a cost (in quantity) at least comparable to black-and-white, if not actually lower. Primary estimates, based on a volume of 30,000 to 40,000 orints per shot, indicate that first-class, three-color litho-prints (8x10) can be had for about 3½ cents each!

My own connection with the work has not, however, been so intimately concerned with this phase as with the actual photographing. There are naturally many practical differences between working in black-and-white and working in color; the whole thing may be best summed up by saying that for success in color, one must pay careful attention to details which are relatively unimportant in ordinary still work.

For instance, even in the routine matter of loading the plateholders, extra care must be taken. Studio loaders, long accustomed to handling ordinary film carelessly, must be schooled to handle the color-films only by the edges, for fingerprints which would be unnoticed in black-and-white, or which could easily be removed by the retoucher, stand out glaringly in the almost unretouchable color prints. Conditions in the loading-room and dark-room which would be quite passable in ordinary still work are impossible when working with color. There should be no dust in the air, nor any on the floor to be stirred up into the air when color negatives are being handled.

In making the exposure, the still photographer has the advantage over the cinematographer. Instead of having to use more light to compensate for the color-camera's beam-splitter and filters, he can simply increase his exposure a bit. So in making production-stills in color, I've usually been able to step right up and shoot almost as though I was shooting black-and-white. The Cinematographer's lighting is usually about right for my shot, and the camera-filters can be balanced for Incandescent light. Exposure must be more accurate than in monochrome.

As to lighting, I've found that the best results usually come with softer, flatter lighting than would be normal for black-and-white. Heavy shadows are simply out for color: they go a dead black in your picture, and are disturbing. Very "hot" highlights frequently tend to wash out and glare so they too should be avoided. The picture should be lit as evenly as possible; but this doesn't rule out a good, normal balanced lighting, with one side slightly highlighted, the other slightly shadowed. But neither the highlights nor

shadows should be extreme. In shooting color stills on the set, the change I've most frequently had to make in the lighting was to throw more light into the shadow-side than the Cinematographer used in his black-and-white picture.

Backlighting in color is debatable. Sometimes it is very effective, but it's easily overdone. When in doubt—don't backlight.

The same principles hold good for exteriors in color. I've gotten some very fine results working in the shade, with reflectors. We've used ordinary, silver reflectors, and found them even more important in color than in manachrome.

And in color work, you run into an entirely new problem in reflection: the color reflections thrown on your subject by the background, and even from the clothes they are wearing. This is a most important point to watch. Some colors, of course, reflect more strongly than others; and some of them can give very displeasing effects. The two worst offenders, I think, are red and blue. Red reflects and photographs very patently, and blue is photographic enemy No. 2. Green is only rarely troublesome in this respect, and yellow seems quite harmless. In one portrait I recently made of one of our stars, I had a red background, and the lady was wearing a blue costume. The red of that background seemed to kick back at her from every angle, and the blue dress threw a bluish tint upward upon her throat and the lower part of her face. The picture would have been far better if I had not had those particular colors to cope with that way. Reds and blues can of course be used—but wherever it is at all possible, the shot should be planned beforehand so that you'll have the minimum of color-reflection.

With any good three-color process, you'll get pretty accurate renditions of most colors. There are a few, though, which should be watched carefully. Greens, for instance, are often tricky. Especially in shooting exteriors out here in California, the greens of foliage are very deceiving: they often turn out to have a lot of brown in them that isn't noticeable to the eye. Other colors sometimes have peculiar psychological effects on different individuals. Reds, for instance, are very irritating to some people, blues depress others, and so on. Reds, and certain shades of blue often stand out more strongly in your picture than they do visually. They attract the viewer's eye—so they should be taken into consideration when planning the composition. A touch of red which might be unnoticed when you made the exposure can very easily disorganize your whole composition.

There is no affectation to the statement that color must be composed as carefully as any other element in the picture. We have already learned from painful experience that a misplaced highlight or shadow in a black-and-white picture can draw the eye away from what we want it most interested in, and that a careless arrangement of lines or masses can throw the picture out of balance, or make the viewer look at anything but the subject. With time, mistakes and experience, most of us have through the years learned how to make these matters of light and shade, tonal gradation, lines and masses work for us, rather than against us. Color is just another of these factors which must be controlled.

All of this calls for more careful planning when you are shooting stills. Exposure, lighting, composition and coloring have to be exactly right, or you might better not make the shot. You can't step in hurriedly and "knock off a still," as you would in black-and-white. This is a factor which will probably correct itself in time. In portraits, one generally has a chance to take things seriously. A little more thought, and color-portraiture is as sure—and vastly



Dr. L. M. Dietrich Passes On

ON DECEMBER 29th Dr. L. M. Dietrich, A.S.C., passed on at the age of 69. The direct cause was attributed to heart attack.

But, men like Dr. Dietrich do not die. His life was too full, too active and we might say too gracious. It was not the kind of fullness that measured itself by dollars, but a fullness that had the respect and love of all those whom he knew and with whom he associated.

For almost a decade he had been associated with the hurly burly motion picture industry, devoting his time to the perfection of a lens that would have given his fellow workers in the American Society of Cinematographers an instrument that would have eased their task, that would have simplified their work. Previous to that he gave his talent to the automotive industry and contributed several important mechanical improvements. Before coming to motion pictures he was with the Cadillac engineering staff.

Many of his articles enriched the columns of this magazine. For a number of years he served in an editorial advisory capacity to the editors of the American Cinematographer, giving of his time, of his knowledge and kindly wisdom.

While Dr. Dietrich has passed on, he will never leave us. We will always have the beautiful memory of a gentleman who unselfishly served his fellowmen.

Problems of Controlling Correct

THE photographic characteristics of positive film being used at present in professional motion picture work are to a large extent standardized. There is little appreciable difference in speed and slope between the competitive types, and this is very gratifying to the laboratory as it permits establishment and maintenance of constant conditions in printing and printing equipment.

The same uniformity, however, does not prevail in the various negative products offered to the market. The reason for this difference is that the principal characteristics required of negative material cannot be perfected in the manufacturing process without the partial sacrifice of other characteristics. Furthermore, with very little exception, a single all-round negative type has been used for general photographic work since the introduction of the Panchromatic Superspeed type, while the variety of problems and tasks to be solved and performed could easily absorb several types of negatives with marked differences in photographic characteristics.

The laboratories processing the negative and print could reasonably object to such variations in negative film, as the existence of such types demands special handling of each type in development, which, of course, would present difficulties in view of machine development. As most laboratories are using single strand machines, it is not impossible to change developing time in order to secure ideal conditions for the rendering of proper contrast in different film types, as this is practically done at present in all laboratories which prefer and employ the "test system" to the "time and temperature system."

The consistency of the negative developer is checked and kept constant by gamma control, and in Hollywood laboratories this gamma value has been generally set at approximately .68 plus minus .05.

The two developing systems referred to in the above are based on two different principles for controlling photographic reproduction of visual contrast as far as the negative processing is concerned.

In the "test system," negative tests exposed by the cameraman at the start of every scene which entails a changed lighting condition, are developed at an average standard time, and from a visual examination of each test the developing time which will render the best possible contrast and density in the corresponding actual negative scene is determined. This method, therefore, undertakes to keep negative contrast in each scene constant by varying the developing time and the developing gamma correspondingly.

In the "time and temperature system," the principal developing factors, time and temperature, and the developing gamma are kept constant. In this case it is entirely the cameraman's responsibility to control proper reproduction of contrast and brightness level by his lighting technic.

Theoretically, it should stand without argument that the "test system" be given unanimous preference in view of the additional help it offers to correct mistakes made by the cameraman in calculating exposure and lighting effects, which were, no doubt, made possible by the absence of proper methods or instruments for determining all existing relations between visual contrast and negative characteristics.

The decision in favor or against either of the two systems, however, is influenced by many practical factors, the

Photographic Reproduction

PART 3

by
Dr. Herbert Meyer, A.S.C.
Head of Hollywood Research Bureau,
Agfa, Ansco Corporation

discussion of which is not within the scope of this article.

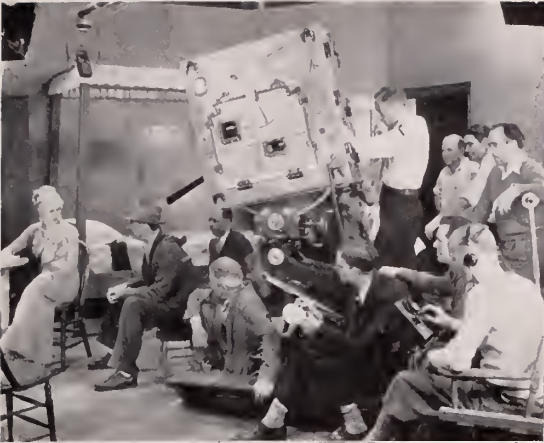
While all laboratories, regardless of the developing system adopted, are accustomed to relying upon negative solution control with a fixed gamma value which is a characteristic, of course, of the film type used in connection with these control tests, it is frequently noticed that this procedure tends to form a habit which may unjustly become a reason for condemning film types differing in gamma from that of the film used for these control tests. This is particularly true of laboratories employing the "time and temperature system" when a difference in gamma is noticed while testing a new product against the control-test film type, it seems to upset the principle of consistency of developing time or speed so essential for this system of development. It has recently been proven, however, that adapting the developing speed to the inherent gamma-time characteristic of a new film type, like Super X for instance, is not impossible for either of the two systems, and the initial difficulty encountered is rewarded, when overcome, with gratifying results.

On the other hand, there is equally no reason why negative types, which sensitometrically show a reasonably higher gamma than .68 when developed at standard machine speed, should be rejected. The scale of contrast variations, existing either in outdoor lighting conditions or produced artificially by indoor lighting, varies to such an extent above and below medium contrast that there are many cases in which, due to low contrast in an object, a reasonably higher gamma characteristic of a negative film type might be advantageous, while in other cases where high contrast prevails in the object a reasonably lower inherent gamma characteristic will be found to render better results.

This, of course, is only true when speaking of that part of photographic reproduction where a distortion of brightness relation or contrast is desired, and not where the task consists of photographically reproducing the correct visual brightness in the object.

In general the negative type with a higher gamma characteristic for a fixed developing formula has obviously more practical latitude in development to that of a type with lower gamma infinity if the higher gamma infinity is not accompanied by too much lack in shadow speed. It is always possible to lower the gamma by shortening the developing time and increasing the exposure or shadow lighting, while it is not possible to raise the gamma value over

Continued on page 58



Assistant cameraman seated in foreground holds remote focus-control.

Following Focus By Remote Control

by

William Stull, A.S.C.

EVER since sound and the moving camera joined forces, the problem of "following focus" has been abnormally complicated. On the one hand, camera technique required increased flexibility in this operation; on the other, sound demanded complete mechanical insulation between the camera and its blimp. A further complication was the fact that save in rare instances, such as the recently developed Twentieth-Century Fox Camera, conventional lens-mounts do not permit a uniform movement and calibration of the external control for lenses of different focal lengths. The commonest mechanism used is probably the type which operates through standardized gears on the lens-mount, and provides an external scale which is marked in terms of each scene's individual focal positions, at the time the scene is made. Other types use individual cams for each lens, often with a cam-and-roller arrangement which automatically adjusts the finder for focus and parallax as the lens is focused. In some designs, these cams are permanently attached to the camera, and swing into and out of position. In others, the cams are separate, and when changing lenses, the proper cam must be inserted. In nearly every case, the follow-focus device leaves something to be desired from the viewpoints of both operating efficiency and sound-insulation.

The Technicolor Motion Picture Corp., in designing the Technicolor three-color camera, reached a novel, yet very practical solution of this problem. A camera through which

three films run simultaneously can hardly be expected to be as quiet as a conventional design; the soundproofing blimp therefore had to be extremely efficient. One of the first specifications for the blimp was that there be absolutely no metallic contact between the camera and the blimp: this meant that conventional focus-control mechanisms, which all involve some form of direct contact between the external control and the camera, could not be used. None the less, the nature of color cinematography called for an unusually precise control of focusing.

The solution reached by the Technicolor engineers is beautifully simple: if mechanical linkage is ruled out, an electrical control should fill the bill to perfection. Technicolor cameras are focused electrically, by a control which may be operated at the blimp itself, or from a point several yards distant.

The control is operated by a pair of tiny Selsyn interlock motors. One of these is attached to the external operating control; the other operates the focusing of the lens. Both motors are excited by the same electrical current, which may be the convenient 110 Volt Alternating Current available on most stages, a line from a sound-truck's power-supply, or on location "wild" shots, from a convenient battery-and-converter outfit. When two Selsyn motors are excited from the same current-supply, they automatically synchronize themselves; if the shaft of one motor moves, that of the other at once moves in the same direction and degree. Either of the two may be the driving motor.

In the Technicolor installation, the shaft of the outer motor is connected to the focusing crank, while the shaft of the inner motor, which is mounted on the camera, is geared to a conventional ring-gear on the lens-mount. When the current is off, the two work independent of each other; but when the current is turned on, they automatically synchronize. The outer control may be a turn or so out of step with the lens-control, but as the current comes on, it jumps forward or back as the case may be, until synchronism is established. Thereafter, either shaft may be moved, and the other moves with it.

The focusing dial is unusually large, and fitted with a fixed pointer running in a spiral track on the rotating dial. The movement of the dial is controlled by a small crank which is geared to the shaft of the Selsyn motor. The movement of the crank for any focal adjustment is about double that ordinarily provided in conventional mechanisms—a feature which simplifies minute focus-changes.

The focusing dial is faced with plain white celluloid, rather than permanently calibrated. Thus the dial may be marked for each scene in terms of actors' or camera positions, and there is no chance of error due to multiple calibrations for lenses of varying focus. The lens-mounts themselves are, of course, calibrated very accurately.

In use, the focus control may be left in its dovetail-clipped mount on the left-hand side of the blimp, or it may be removed entirely, connected only by a length of light cable, leaving the assistant free to take any position from which he can see the action clearly.

The Technicolor blimp and finder system are also worthy of notice. The blimp is of unusually good sound-absorbing qualities, and most convenient for the camera crew. An interesting feature of the design is that the window on the left side of the blimp, which gives a view of the lens-mount and its calibration, is fitted with a magnifying lens rather than a plain glass, making it very easy to read the focusing scale, diaphragm setting, etc.

The finder departs radically from usual practice. Due to the size of the blimp, a conventionally mounted finder

Continued on page 60

TABLE I
Development Characteristics of Rapid Developers with
Eastman Super-Sensitive Panchromatic Cut Film
(July, 1935) at 65° F.

Developer	Time	Gamma	Fog	Relative Emulsion Speed* (Per Cent)	Highlight Density
D-82	1 Min.	0.57	0.12	85	0.73
D-82 + caustic	1 Min.	1.00	.15	105	1.33
D-9	1 Min.	.55	.10	90	.70
D-9 + formalin	1 Min.	.52	.12	70	.63
D-8	1 Min.	1.29	.12	35	1.04
D-72	1 Min.	.40	.12	65	.50
D-82	2 Min.	.83	.12	125	1.15
D-82 + caustic	2 Min.	1.35	.21	125	1.88
D-9	2 Min.	.89	.12	110	1.19
D-9 + formalin	2 Min.	.81	.14	75	.98
D-8	2 Min.	1.49	.15	60	1.54
D-72	2 Min.	.70	.13	85	.96
2-Bath (1st bath 1 Min. (75° F.)	1 Min.	.65	.15	105	.91
D-82	3 Min.	1.01	.17	130	1.45
D-82 + caustic	1 Min.	1.00	.15	105	1.33
D-9	2½ Min.	1.02	.14	110	1.40
D-9 + formalin	3 Min.	1.00	.17	75	1.20
D-8	40 Sec.	1.00	.11	30	.75
D-72	3½ Min.	1.02	.17	100	1.30
Two Bath					
(1st Bath)	1 Min.	1.00	.25	105	1.35
(2nd Bath)	1 Min.				
(1st Bath)	1½ Min.				

*The relative emulsion speeds are expressed in percentages, the speed obtained by developing for 3½ minutes in D-72 (gamma 1.0) being taken as 100%.

WITH the increasingly widespread use of photography, situations are occurring more and more frequently when it is desired to obtain the finished photograph in as short a time as possible after the negative is exposed. In the past, this situation has often arisen in news photography but with the more recent applications of photography as, for instance, in such fields as television and the photographic recording of the finish of horse races, the need for rapid processing is becoming more and more important.

Most of the published procedures for rapid press photography involves the use of quick acting developers and fixing baths of more or less conventional composition, followed by a brief wash. The print is then made directly from the wet negative or after the negative, which was hardened during processing, has been dried rapidly.

The rapid drying may be accomplished either by directing blasts of warm, dry air against both faces of the gelatin film, by removal of the water by means of a volatile solvent such as alcohol, or by absorption of the water with a suitable strong solution having an affinity for water, such as a saturated solution of potassium carbonate. The treatment with alcohol is not recommended for use with film since methyl alcohol attacks the film base, tending to make it curl and buckle on drying. Ethyl alcohol can be used successfully, provided: (a) the film is not bathed in the alcohol for too long a period which would otherwise cause buckling, (b) that the alcohol is diluted with 10 per cent of water, and (c) that the film is finally dried with air at a temperature not greater than 70° to 80° F. The use of undiluted alcohol and air which is too hot causes excessive desiccation of the gelatin which renders it opalescent. The

Rapid

opalescence can be removed by soaking the film in water and re-drying slowly.

When the emulsion is dehydrated with a saturated solution of potassium carbonate, traces of the carbonate are left in the gelatin so that if the relative humidity is very low, it may crystallize, while with high humidity the negative remains sticky. Also, it is necessary to rewash and dry the negative in the usual manner after the rush prints have been made. It is safer and more satisfactory, therefore, to dry the negatives with hot air.

A satisfactory rapid processing procedure for news photography should fulfill the following requirements:

(1.) In order to reduce to a minimum the time required for making up the baths, they should be in the form of stock solutions ready to use with very little measuring, mixing, or diluting.

(2.) In order to save the time required for cooling the solutions, it should be possible to use them over a range of temperatures at least from 65° to 80° F.

(3.) In order to lessen the danger of mechanical injury to the emulsion and to allow rapid drying with hot air, the

solutions should not have a great tendency to swell the emulsion and should harden it thoroughly.

(4.) Photographically any rapid method to be satisfactory, should give good picture quality with high emulsion speed, since underexposure is very apt to be encountered.

The three hand processing methods to be described meet these specifications quite well, each method having some specific advantage under certain conditions.

Two-Bath Development with Developer SD-6

For the majority of cases, a rapid two-bath hardening developer is satisfactory since it prevents excessive swelling, provides rapid and thorough hardening of the gelatin while in the developer, and allows the use of comparatively high processing temperatures. Also, it automatically eliminates the danger of over development and provides an almost constant degree of development in spite of variations in the time of treatment which can otherwise easily occur in hand processing for such short times.

The film is placed in the bath No. 1, whereupon the emulsion absorbs a certain quantity of the solution and thus a definite quantity of the developing agents, but because of the low alkalinity of the solution, very little actual development occurs. Then, when the film is placed in the alkaline bath No. 2, development proceeds rapidly at first, but since the developing agents diffuse out from the film, after a short time the development practically stops. The result is that considerable variation in the times of treatment have very little effect on the degree of development.

Also, the separation of the developer chemicals into

Processing Methods

by

H. Parker and J. I. Crabtree
Communication No. 577 from the
Kodak Research Laboratories

TABLE II
Characteristics of Developers Suitable for Underexposures
(Times of Development for Optimum Emulsion Speeds)

Developer	Time	Gamma	Fog	Relative Emulsion Speed	Highlight Density
D-82	8 Min.	1.20	0.40	155	2.04
D-82 + caustic	3 Min.	1.50	.40	145	2.25
D-9	9 Min.	1.45	.40	150	2.25
D-8	6 Min.	1.60	.40	115	2.30
D-72	14 Min.	1.33	.40	120	2.07

two baths makes it possible to use formalin which gives a rapid and high degree of hardening in alkaline solutions, while avoiding the troublesome reactions that otherwise occur between formalin and the developing agents in a single bath developer, which tend to reduce the rate of development and often cause bad aerial fog and stains.

The formulas for the two bath SD-6 developer solutions are given in the section on practical recommendations. Sodium sulfite is used in the first bath to prevent excessive swelling of the gelatin emulsion before it can be hardened by the formalin in the second bath. The small quantity of phenasafranine is a safeguard against the formation of aerial fog which might otherwise occur if, during treatment, the film were exposed much to the air. A portion of the formalin in the second bath reacts with the sulfite, liberating sodium hydroxide so it is not necessary to add any additional alkali. The two solutions used to prepare bath No. 2 slowly deteriorate when mixed and, therefore, the bath must be used within a short time after it has been mixed, but the separate solutions keep well before mixing.

The film should be bathed for one minute in bath No. 1, then transferred to bath No. 2 without rinsing and kept thoroughly agitated therein for one minute, taking care not to expose the emulsion surface to the air, otherwise aerial fog is apt to be produced. It is convenient to hold the film by one corner with a film clip in order to facilitate handling and allow positive agitation. After development, the film should be rinsed briefly, preferably in an acid stop bath SB-1, and then fixed with thorough agitation to ensure neutralization of the alkali in the film and to hasten fixation. As soon as the film has cleared, it can be washed and dried or printed wet as described later.

The F-5 hardening fixing bath gives excellent results when used after this developer but, if desired, an ultra-rapid non-hardening bath may be used. In the latter case, it is particularly desirable to rinse in the acid stop bath between development and fixation.

Since development is almost complete soon after the film has been placed in bath No. 2, the degree of development can not be controlled effectively by varying the time of treatment in the second bath. If a desired degree of contrast is not obtained by normal treatment, development can be altered slightly, say, over the gamma range from 0.6 to 0.7 with Super-sensitive Panchromatic film at 75° F., by changing the time of treatment in the first bath. If a greater increase in the contrast is desired, it can be readily obtained by reimmersing the negative in bath No. 1 for a short time after rinsing briefly in water to remove the excess of solution carried on the surface of the film.

When used in tray development, these solutions are not affected by aerial oxidation as rapidly as are equally energetic single bath developers, because the developing agents are held in a weakly alkaline solution and are well protected by the sulfite, while the separate solution containing

the alkali contains no developing agents. When a negative is developed, it carries a small quantity of the developing agents into the second bath, but the concentration resulting from this action is low so there will be no danger of staining the film even if the developing agents are oxidized.

Although this system of development is particularly designed for use at high temperatures, it can be used satisfactorily over quite a range of temperatures from 65° to 85° F. Below 65° F., the degree of development is probably too low to be useful, while above 85° F., there is danger of the emulsion swelling excessively. The rate of change of activity with temperature is lower for this developer than for the more usual single bath developers. For instance, with Eastman Super-sensitive Panchromatic cut film at 75° F., a gamma of 0.65 was obtained equal to that given by developing for one minute in full strength D-72, but when both developers were cooled to 65° F., the two bath developer gave a gamma of 0.50 while the gamma obtained in the D-72 had dropped to 0.40. In both cases

Continued on page 58

RAPID TWO BATH DEVELOPER

(Formula SD-6)

First Bath

	Avoirdupois	Metric
Elon	44 grains	3 grams
Sodium sulphite, desiccated	365 grains	25 grams
Hydroquinone	88 grains	6 grams
Sodium sulfate, desiccated	3 1/4 ozs.	100 grams
Sodium carbonate, desiccated	292 grains	20 grams
Water	32 ozs.	1 liter

Second Bath

	Avoirdupois	Metric
Solution 2A		
Phenosafranine (1:1000 sol.)	5 drams	20 cc.
Sodium sulfite, desiccated	1 2/3 ozs.	50 grams
Potassium bromide	30 grains	2 grams
Water to	32 ozs.	1 liter
Solution 2B		
Formalin (40% solution)	6 ozs.	200 cc.
Water to	32 ozs.	1 liter

To make the second bath, mix equal parts of solutions 2A and 2B.

Acid Stop Bath

(SB-1)

	Avoirdupois	Metric
Water	32 ozs.	1.0 liter
Acetic acid (28%)	1 1/2 ozs.	48.0 cc.

Acid Hardening Fixing Bath

(F-5)

	Avoirdupois	Metric
Water (about 125° F.)		
(52° C.)	20 oz.	600.0 cc.
Sodium thiosulfure (hypo)	8 oz.	240.0 grams
Sodium sulfite, desiccated	1/2 oz.	15.0 grams
Acetic acid (28% pure)	1 1/2 fl. oz.	47.0 cc
Boric acid, crystals	1/4 oz.	7.5 grams
Potassium alum	1/2 oz.	15.0 grams
Cold water to make	32 oz.	1.0 liter



Alfred Gilks, A.S.C.

A Disciple of Restraint --Is Alfred Gilks

by
Harry Burdick

WHEN upper brackets of top-flight ace cinematographers are compiled year after year, Alfred Gilks can be depended upon to have won his way to conspicuous position and rating.

An alumnus of the old Lasky-Vine Street academy of celluloid colossals, he has lensed his noteworthy cinematographic career through such early triumphs as *Old Ironsides*, down to *Ruggles of Red Gap*, and his latest camera contribution, *The Milky Way*, revealing Harold Lloyd.

A wide variety of dramatic works have paraded his cinematographic instrument from lens to negative, each possessing distinct merit and evident artistic charm. Currently his *Ruggles of Red Gap* is attracting exceptional acclaim as one of the best pictures of the year just past.

Selections naming the so-termed best ten pictures of the year are, as this is typed, sprouting from all corners and promise to be as numerous and variable as the All-Amer-

ican football selections that blossom forth each late November. But it is significant that whatever source the nomination, *Ruggles of Red Gap* finds prominent place. Critics and reviewers, however they differ on other pictures, appear to be in consensus as to the outstanding merits of this production.

A tribute indeed voluminous for Gilks' uncanny aptness at cinematographic delineation. His portraiture of Charles Laughton is testimony to the wide artistic comprehension of his genius. This noted star is justly renowned for his dramatic roles. Yet in the Gilks vehicle he assumes robes of an innocuous, almost pathetically humorous character. Gilks was able wholly to effect this unusual visual transformation for the actor. His skillful lighting technic ever reveals Laughton with no trace of menace, actual or implied. Instead, he clothes his face in a bland, moon-lit innocence throughout, even during the Gettysburg Address sequence, that captivates audiences and makes the character completely real and believable.

The Harold Lloyd opus, soon to be unveiled to world-wide audiences, presented also situations calling for precise characterization of definite gradations in mood. The comedy sequences performed by Lloyd are done in short, fast cuts. They are on and off the screen in rapid tempo that gives onlookers no time for analytical reflection. They must see the laugh-provoking action. These scenes perforce are not only well-lighted but completely lighted as to detail, that the entire picture may be instantly and fully grasped by optical senses of witnesses. But, throughout the picture are many scenes of dramatic value and weight. Mood of these heavier scenes must needs be in accordance to the action and story. Hence, the fast comedy scenes dare not be too violently brilliant. Through careful exercise of craftsmanship Gilks has been able to maintain a fine balance and a smooth fluidity not only of movement but of mood.

In all of Gilks' cinematographic contributions, one readily discerns an admirable photographic restraint, a deliberate subjection of camera mechanics to dramatic force and exposition. One is never abruptly conscious of the constant presence of a camera. His plots unfold naturally and gracefully. He never employs an impressive cinematographic effect for its own technical sake; one that is a camera triumph but which diverts attention from the scene itself. He can be trusted never to kill a scene photographically, but to accentuate its screen value and to bring it out vividly.

Prevailing problems of studio practice he meets with practiced ingenuity. His technical mastery of the physics and chemistries and instruments of his profession is comprehensive. Not a modicum of this command of available media is based on a most valuable experience some half-dozen years back.

For nine months he cruised around the world with William K. Vanderbilt on the yacht of that collector of oceanography. With camera, Gilks captured scenes in hidden corners of the world, many of which had never before been invaded by motion picture explorers. He was thousands of miles from his laboratory base. He took scenes under blazing tropic suns beating on mirroring seas. He penetrated deep, dark jungles and in murky rain took scenes never again to be visited. Under conditions ranging from one cinematographic extreme to the other he performed, with no daily laboratory reports to guide, relying entirely upon his own professional skill and ingenuity, and lost not a single foot of film through inadequate handling. A most exceptional achievement and one that minimizes even the most perplexing studio problem to comparative fundamental proportions.

Continued on page 60

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HOLLYWOOD, CALIF**Problems of Controlling Correct Reproductions**

Continued from page 52

that inherently characteristic for the given type, at least not without an objectionable increase in grain.

One important characteristic of the negative material is its sensitivity to light or radiation. This sensitivity is usually classified in:

a. general or blue sensitivity, referring to the original sensitivity of the silver bromide to radiation of shorter wave lengths, and

b. color sensitivity, referring to additional sensitivity of sensitized silver bromide to radiation of longer wave lengths.

When comparing sensitivity of different negative types by either regular pictorial exposure tests or by sensitometric methods, a distinction between the two components is usually not made and the results then refer to overall sensitivity only.

Correct determination of overall sensitivity should always be made by developing the test types in question to identical gamma values. In case this is neglected and the gamma values are different, the comparative speed figure will change its value with every density step. When the different types are developed to identical gamma values, the speed relation is constant over the entire range of the straight-line portion and the only possible variation of this speed relation that might be encountered is where the extension and the shape of the curved parts vary.

For practical reasons it is, therefore, advisable, when making comparative tests of overall sensitivity, to distinguish between a speed figure relative to a speed comparison of the straight-line portion measured for equal gamma values and a speed figure relative to the speed comparison of the curved portion which practically takes into consideration the toe section only and which, therefore, is identical to a combination of threshold and shadow speed.

An additional way of expressing speed comparisons of negative types which is commonly practiced, is that of indirectly calculating negative speed from the printer lights required to give a normal print of each negative. As the printer light in general is selected with the intention of giving the print sufficient detail in the high lights, this method of speed calculation refers principally to speed comparison for high negative density portions.

Another characteristic important in the consideration of our problems is the latitude of the negative material expressed by the extension of the straight-line portion. Normally it should be assumed that the farther the straight line portion extends towards the upper end of the characteristic curve, the better it should be regarded in view of the pro-

tection it offers against wrong calculation of exposure. In practice, however, it will be found that the laboratories quite often prefer a negative type with a relatively low shoulder break. The reason for this is that the exposure range of the standard Bell & Howell printer with 22 printer lights has a rather limited latitude, and that, therefore, naturally the danger of encountering high lights of unprintable high density is emphasized in cases where negative types are used with high shoulder breaks. The new automatic Bell & Howell printer has an increased range of printer lights which in itself should be considered a needed improvement and a step forward.

The next article will deal with color sensitivity of photographic emulsions in relation to visual sensitivity.

Shooting Color Stills

Continued from page 51

more effective—than black-and-white. As to production-stills, color will probably be used first largely on color films; and while color cinematography is yet so new, everyone in the troupe is willing and eager to work more thoughtfully, even if slower. When color comes to the making of production stills for monochrome productions, the still man will simply have to demand more consideration. The material before his lens—sets, costumes, etc., as well as lighting and subjects—will have to be coordinated for color as well as for black-and-white filming. Some modification will have to be made in makeup: at present, for color we find a light street makeup photographs best; regular panchromatic makeup, as is used in black-and-white sets, photographs exactly the same unnatural ruddy brown it appears to the eye. Above all, the color stillman will have to receive more time and thought from the other members of the troupe. But all of these things will surely remedy themselves as we accustom ourselves to working—and thinking—in color.

Rapid Processing Methods

Continued from page 55

the two bath developer, SD-6 gave noticeably more shadow detail than the D-72.

The characteristics of this developer with Eastman Super-sensitive Panchromatic cut film (July 1935) are given in Tables I and II. It will be noticed that the two bath developer compares favorably with other developers for the lower degrees of contrast, but that it does not compare so well when development is forced in order to obtain high contrast or the highest possible emulsion speed.

Continued Next Month

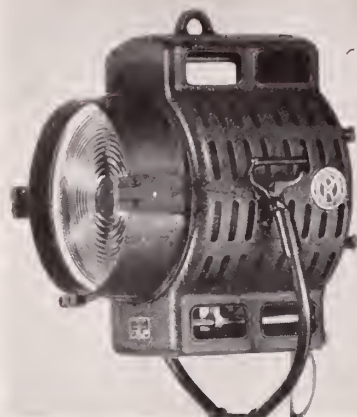


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Following Focus by Remote Control

Continued from page 53

would be abnormally far from the lens, and would introduce a considerable amount of parallax. The finder, therefore, is built into the blimp, with its lens immediately above the camera-lens. A reflecting optical system takes the image to a point on the right-hand side of the camera, whence a second reflecting and magnifying system bends it through another 90° angle, to be visible from the rear of the blimp. A large roof-like shade hinges on the right side of the blimp, and creates a perfect shadow-box, shielding the finder from the light on the set. Finder-mattes of conventional type are fitted inside the camera. This system, while of course eliminating all horizontal parallax, naturally has a certain degree of vertical parallax. This is corrected by a mechanism which slides the matte up and down as the finder-lens is focused. The finder-focus, which is controlled by a small crank at the right of the blimp, is not connected with the focus of the lens. Having the finder on one side of the camera, and the lens-focusing control on the opposite side, obviously relieves the congestion often experienced with conventional equipment where both the operative and his assistant work on the same side of the blimp.

Technicolor cameras do not provide for focusing the actual image of the lens on a ground glass, as do most studio equipments. They do, however, provide a means of focusing the actual image of the lens through a magnifying microscope. As is well known, three films run through the two apertures of the Technicolor camera: to the right, and

parallel with the lens' axis, a conventional bipack; to the rear, panchromatic negative which records the green components. The light is divided by a partially-reflecting sputtered-gold mirror mounted between prisms, just behind the lens. Accurate visual focusing is provided without disturbing this prism-black by an optical system which, through the left-hand side of the prism-black, utilizes the partial-reflecting characteristic of the mirror to provide a composite of the images cast on the two apertures. It is interesting that in this system the image reflected from the front side of the film is focused, rather than an image cast through the film. It is entirely possible to watch the focus on the film during the actual shooting of a scene.

A Disciple of Restraint

Continued from page 56

To an uncanny degree, Gilks realizes and accepts the production responsibilities shouldered on the cinematographer functioning as Director of Photography. No one, possibly, on a studio set is faced with a more constant stream of decisions that must be instantly rendered and correctly. With each new set-up he must immediately arrive at a mental estimation of the valuation of that scene in terms both of dramatic worth and production time on the stage. With productions closely budgeted and shooting schedules finely drawn, a delicate poise

An Artreeves Sound Recording outfit in Mexico being operated by B. J. Kroger for the Jose Bohn Productions.



must be maintained between the dramatic or artistic demands of a scene and the cold, commercial commands of the production office.

If too much devotion and corresponding time is given for a set-up, that scene may turn out to be a screened success but a financial failure in that it cost more than it contributed to the picture in its entirety.

To the contrary, if a scene is slighted with eye only to production speed the results are not only disastrous to the completed work but to the professional standing of the Photographic Director.

It is this establishment of scene values

in conflicting terms of art and trade that calls not only for instant determination of far-reaching decisions but an ingrained drama sense, an inherent intuition of theater evaluation.

Which brings to the surface once again, the manifold demands made on the professional experience and equipment of the practicing cinematographer.

That Alfred Gilks has through the years achieved and retained high esteem of connoisseurs, critics and producers, of itself tells how fully he has taken in hand the manifold reins directing the cinematographer to that enviable niche known as "tops."

"Process-Shot" Economies Made "Captain Blood" Possible

Continued from page 49

to remove the empty guns, and replace them with loaded ones. The guns snapped into their contact-plugs like so many radio-tubes, and as soon as the new guns were in place, the scene could go on.

Sinking the "Arabella" was interesting, and gave us some highly effective shots. (I still can't agree with the cutter who left my pet shot of the sinking out of the picture!) We hammered the ship unmercifully with the "enemy's" artillery, blew her up, staged a very effective fire, and finally let her slip beneath the waves. And it didn't take 3,600 pounds of dynamite and a \$60,000 ship, either!

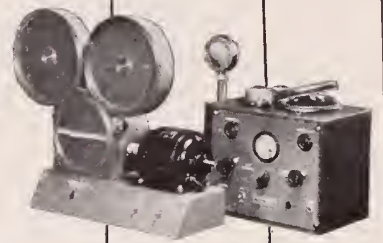
In fact, if you came right down to the actual construction cost of the ships, comparing our miniatures (which, as one director who wanted one of them for his den learned, aren't so very miniature after all, being over 18 feet long with sixteen-foot masts!) with full-size ships, the saving effected is still more impressive. The most economical figure our budgeteers could give for constructing two real ships was \$120,000.00—disregarding all operating and photographing costs. Providing three ships, as we did, would have cost \$180,000.00. Our three miniatures were built for a total of \$3,300. If you want to deal kindly with full-scale shipping, and take a two-ship fleet, the saving amounted to \$116,700; if you figure on a basis of three ships delivered, the saving is \$176,700. Or, to put it differently, thanks to modern special-effects cinematography, we were able to deliver every shot that was too expensive or too dangerous to do with real ships and people (not to mention a lot of other process footage) for 1/70 the cost of merely building three full-size ships!

The savings in production-time were quite as impressive as the savings in money. The production itself had a nine weeks' schedule for making the dramatic

scenes. The special-process staff had three weeks' head start for their work, and completed their last shot on the same day the last dramatic shot for the production was made. I think "Captain Blood" set a precedent for the industry in one respect: due to the extreme expense of making the production by straightforward methods, the decision as to whether or not the film was to be made at all was contingent upon the work of the special-process staff. Some of the executives frankly doubted that the battles, etc., could be successfully made as we planned.

The business of blowing up the rawboats was filmed in half a day's work, as compared with four or five full working days which would have been required for full-scale methods. In making the miniatures of the battle sequence, standing sets around the tank precluded shooting our miniatures except between

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11:30 a.m. and 2:30 p.m. The entire battle was filmed in ten of these four-hour days. Three weeks' would have been a short schedule for doing it with full-scale ships!

What made all this possible was not the skill of any one man, but the skill of the many specialists in a finely organized department working with the most com-

plete special effects equipment existing in any studio. Without this perfected team-work, the shots which made "Captain Blood" possible would themselves have been impossible.

Photo Contest

• The Morgan Camera Shop of Hollywood is conducting a photo contest. Their announcement reads as follows:

"We want action, candid, portrait, landscape, or your favorite photos for the Morgan Photo Contest. Pictures will be judged for subject matter, composition, and technical quality. As you already know the contest is open to users of 35mm film in miniature cameras only. We have waived the entrance fee, but would those who send their prints from a distance be so kind as to enclose return postage? That famous candid photographer, Victor Haveman, of Columbia Studios, has consented to be one of the judges. The other judges, to be announced later, are prominent figures in the photographic world.

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One first prize of \$50.00 worth of merchandise.

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Note: We have been asked to extend the closing date to March 15, 1936."

Dored, A.S.C., in Africa

John Dored, A.S.C., has been in Africa since July working the newsreel "war stuff" in Ethiopia. He expects to remain there until some time in March.

On December 24th he writes from Addis Ababa, Ethiopia. "This is my sixth month in Ethiopia. There have been some excitements once in a while, but the big one was on December 6th in Dessie, during the Italian air raid. The bombing of the place was a real "hot affair" at which I was present and got some nice shots. At present the war situation has become a bit draggy, looking from a "camera angle" standpoint.

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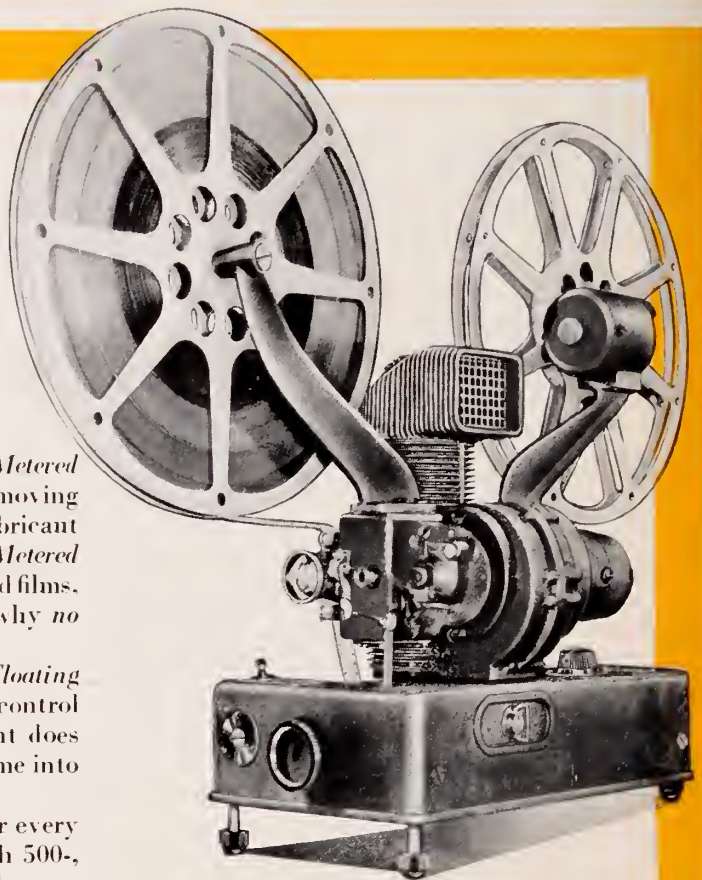
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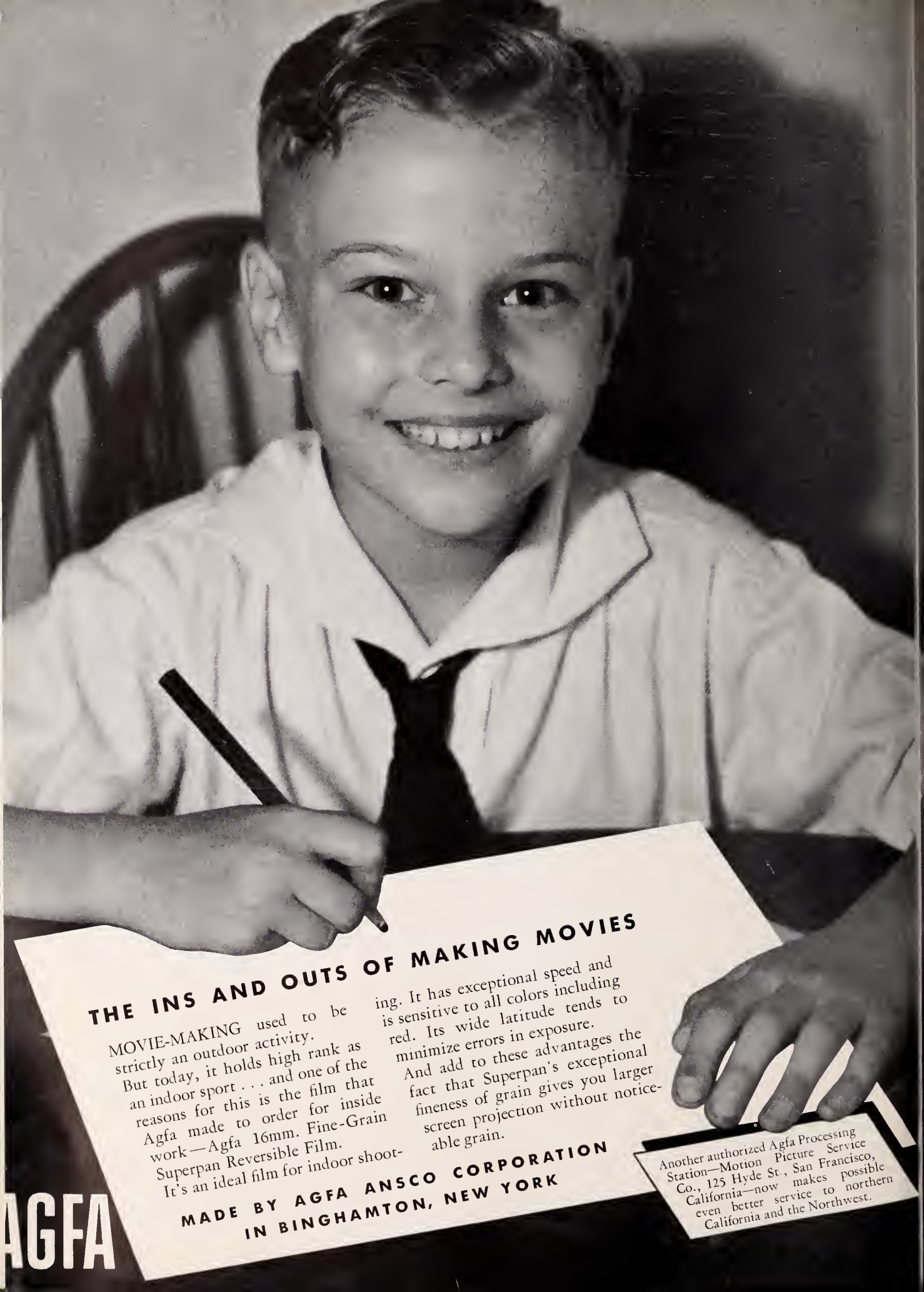
FEBRUARY
1936

this issue

Musical Score for Pictures
Trend in 16mm Sound Projection
Using Light to Help Composition
A. S. C. Gives Honorable Mention
About Transitions
... and other features

25c





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AMATEUR MOVIE SECTION

Contents . . .

MUSICAL Score for the Prize Pictures by Wm. Stull, A.S.C.....	68
TREND in 16mm Projection with Special Reference to Sound by A. Shopiro.....	70
USING Light to Help Composition by J. Belmar Hall.....	71
MAKING on 8mm Film Viewer by E. V. Soderberg.....	72
A.S.C. AWARDS Honorable Mention to Amateurs.....	73
CONTINUITY for a Family Thriller by Borry Stoley.....	74
HOW ABOUT Your Transitions? by Wolter Blanchord.....	75
WHEELS of Industry.....	75

Next Month . . .

- The Winner of the Grand Prize in the American Cinematographer 1936 Amateur Movie Contest will tell you how he made his picture. He will give you a complete outline of his methods and procedure.
- There will be an article or two by A.S.C. members, professionals who use 8mm or 16mm cameras themselves. They know the limitations of the amateur camera, and will speak authoritatively.



Musical

FRED ELLS started it. His entry in the 1935 American Cinematographer Amateur Movie Contest arrived complete with an impressive musical score on phonograph records. Without that score, his film, "In the Beginning," was just a rather more than ordinarily fine documentary picture; with the music, it was an enthralling experience. In fairness to the other contestants, "In the Beginning" had to be judged as a silent picture; and it speaks well for Ells' cine-craftsmanship that even without the help of the music, his film placed as one of the most notable runners-up. Had the judges viewed it the accompaniment of its superbly tailored musical accompaniment, it must surely have gained even higher honors.

A few days after New Year's, the Editor said to me, "Bill, we're showing the prize films to the Los Angeles Amateur Cine Club next week. I'm putting 'In the Beginning' on the program, too; of course I'll show it with its music, so we really ought to have some music for the others. Your hobby is collecting phonograph records: d'you think you could work out scores for the rest of 'em?"

That night I carried home four cons of assorted prize-winners, wondering what sort of music they'd need. And how I hoped I had the right records in my library!

The first step in the scoring job was to run each of the pictures, not once, but half-a-dozen times or more, until I was thoroughly familiar with all the changes of mood and tempo. The people who made the pictures each had a definite story to tell in film; my score had to tell that same story in music—and sight and sound had to be in step.

Of course, in arranging scores for a diversified group of films such as these, the logical thing was to begin on the films that were dramatically simple, and work up to the more intricate ones. Tatsiuchi Okamoto's film, "Vanishing Autumn," which won the Photography Award, offered the greatest dramatic simplicity. Throughout, it kept to one dramatic mood—one of gentle melancholy. The tale it told was of an orphaned child and her aged grandfather, eking out a sorrowful existence in the mournful autumn. Music for this film should be subdued and simple, yet suffused with a poignant beauty, to match Okamoto's cinematography. So I began the accompaniment with the Pre-

lude to Act I of Verdi's "Lo Traviata," played by Arturo Toscanini and the Philharmonic Symphony Orchestra of New York; Victor record No. 6994. This was followed by "Coeur Brise" (Gillet), played by Marek Weber and his orchestra; H.M.V. (British Victor) record No. B-3026. Next, I used the opposite side of the first record—the Prelude to Act 3 of "Trovioto"; Victor No. 6994. At the moment, near the end of the film, when the little girl runs from her grandfather to drop in prayer by a wayside shrine, I shifted to "Death of Ase," from Grieg's "Peer Gynt Suite," played by Eugene Goossens and the Royal Opera Orchestra; H.M.V. record No. C-1298. This completed the score.

Paul Burnford's "Moods of Nature," which captured Documentary Class honors, offered a greater variety of moods. It began with a long sequence showing nature in a tranquil aspect; then came the wind, whistling a screaming warning of an oncoming storm; next came the storm itself, portrayed especially by the thunderous-voiced surf; lastly, Nature's calm was again restored, but with a distinct note of the everlasting permanency of Nature's expressions. To tell the first part of the story, I chose a selection from Ketelbey's Suite, "In Fairy Realm"—"The Moonlit Glade," played by Albert W. Ketelbey and His Concert Orchestra; Columbia (British) record No. 9409. As the wind sequence started, the music switched to Rimsky-Korsakoff's "Flight of the Bumblebee," the second of two selections on Victor record No. 6579, played by Frederick Stock and the Chicago Symphony Orchestra. For the storm itself, my library failed to produce an orchestral record of sufficient length, but yielded on organ selection of exactly the right type to sing of the thunderous waves: Boellmann's "Toccata," played on the organ of the Cathedral of St. Jean in Lyons, France, by Edouard Commette; Columbia record No. 50125-D. For the concluding sequence, Wolfard-Davies' "Solemn Melody for Orchestra and Organ," as played on Columbia record No. 7136-M by Sir Hamilton Harty and the Halle Orchestra, gave not only the exactly right mood, but a perfect musical transition from the preceding organ solo.

T. Lawrenson's prize "home-movie," "Happy Day," struck on entirely different note. It tells of a delightful youngster, Ian (aged a mature two years), and his joyous day at the beach with his parents. The camera follows him from the time he toddles downstairs, through his breakfast, Daddy's announcement that there'll be a picnic and the joyful preparations, through the thrills of wading in the ocean, building sand-castles, a picnic-lunch, a sedately exciting ride on a donkey, ice-cream, to the slow, sleepy progress home arriving just in time to escape a shower, have dinner and a bath, and slowly climb upstairs to bed. In the main, this calls for light, happy music (not too jolly), which provides merely a cheerful background, but does not intrude on the simple naturalness of the picture. Again Mr. Ketelbey was laid under contribution: the score started with his "Wedgewood Blue," as played on Victor record No. 36090. From the time Daddy announces that the weather-mon promises good weather for the picnic, impatience is the order of the day, so Ketelbey's "The Clock and the Dresden Figures," for which a ticking clock beats time, is

Scores for the Prize Pictures

by
William Stull, A.S.C.

used; this is played by Mr. Ketelbey and his Concert Orchestra on Columbia record No. 50334-D. As the party arrives at the beach, the sprightly "Wedding of the Roses," played by Dajos Bela Artists Orchestra on Columbia record No. G-59072-F is used. This takes Ian through to lunch time, when we go back to the music that accompanied his breakfast, though in a slightly different version: "Wedgewood Blue," played this time by the composer, Albert W. Ketelby and his Concert Orchestra on Columbia record No. 50334-D (the reverse of the second disc). As Ian points away from his lunch to where he sees the donkeys, but one piece could fit: "The King's Horses," played by Jack Hylton and his Orchestra on Victor record No. 22619. For the remainder of the picnic (we "cut" the previous disc half-played) we use Victor record No. 19758—"Nola"—which very conveniently slows its rhythm at exactly the right point to synchronize well with the homeward trip. As the rain starts to pitter-patter on the windowpane, the picture again tells us what music to use: Brunswick record No. 7487, "Isn't This a Lovely Day to Get Caught in the Rain?" by Fred Astaire and Johnny Green's Orchestra. As the music starts to modulate into the vocal chorus, change to "Glow Worm," Victor record No. 19758, which is on the other side of "Nola"; and this will carry Ian off to bed. If you can find a record of "Little Man, You've Had a Busy Day," which doesn't start right off with a vocal chorus (I couldn't find one!), that would of course be even more fitting.

At this showing, another of the runners-up was exhibited: "Chronicle." And this picture is a problem in scoring! It runs what the old-school critics would call the gamut of emotions and moods. If it is to be scored at all, it must have a score that runs a similar gamut, and this calls for a variety of records, and quick changes. I had to use eleven records for the score—and not one was played through! The picture, entirely in close-ups of hands, tells the story of a boy from boyhood to the time when, on a "wild party" on his twenty-first birthday, he drives drunkenly into a lamp-post, killing his companion and sending him to trial and prison. For the opening titles, the first strains of Ferdie Grofe's "Metropolis" (Part 1), played by Paul Whiteman's Concert Orchestra, furnishes an accompaniment. The first sequence is accompanied by Victor record No. 9904, record 3 from Album C-11, Victor Herbert's "Yesterthoughts." As the baby hand drops the teddy-bear, Serge Koussevitzky's string-bass solo, "Sonata Largo," Victor record No. 7159 is begun. As the youngster grows up, a shot of a grotesque toy duck cues a change to "The Toymaker's Shop," the opening number in "Selections from 'Babes in Toyland,'" Victor record No. 9148



(Record No. 8 from Album C-1). On the next birthday we are shown, the youngster has grown to be a good-sized boy; this sequence is accompanied by "Rose-beetle Goes A-Wooing" (Armandola), played by Ferdy Kauffman and his Orchestra on H.M.V. record No. B-3507. At this birthday-feast, the boy's hand slyly slips down from the table to give a morsel to his dog; obviously "The Whistler and His Dog" (Victor record No. 19869) is indicated. At the end of the dog sequence, we change records to get sufficient playing-time, carrying on with the other side of the same disc, "The Warbler's Serenade," by Arthur Pryor's Band. This carries on to the scene where he is shown drawing a poster for a boyish circus; the next scenes depict him naughtily drawing in his Bible, and, later, as a Boy Scout, so we change to "Kungssang," Victor record No. V-20004, played by the Royal Swedish Navy Band. As the boy grows into a young man, "Fashionette," which Joe Rines and his orchestra play on Brunswick record No. 4199, is the theme. Then, as the last fateful birthday-party begins with a close-up of a wine-bottle, Part 3 of "Metropolis," Victor record No. 35934, is begun just at the start of the vocal interlude. It is perfectly motivated for both the drunken sequence and the auto-crash. As the court clerk's gavel starts the slow-paced closing sequences of the film, the last record comes on: Gounod's "Mors et Vita—Judez," played by Lawrence Collingwood and the New Symphony Orchestra on H.M.V. record No. C-1969.

Ells' score for "In the Beginning" consists of the whole of Victor Album No. 182, which consists of liturgical music by the Sistine Choir of Rome. It is a beautiful and altogether fitting accompaniment to a remarkable film. Ells, I think, had the advantage of being in some measure able to tailor his film to fit the music, rather than having to fit the music to the film.

For the Grand Prize winner, "Red Cloud Lives Again," Dr. F. R. Lascher, who made the film, arranged his own score. His accompaniment shows the same touch of masterful simplicity which made the picture a winner. Dr. Lascher had a number of different themes to provide, yet

Continued on page 78

Trend in 16mm Projection, With Special Reference to Sound

by
A. Shapiro*

THE PURPOSE of this paper is to review briefly the progress made in the development of 16mm projection, the effect upon it of the introduction of sound, and to determine what trends are discernible in this rapidly moving industry.

Originating as a hobby for amateurs, 16mm films during the initial period of growth found their largest market in the home field. Despite remarkable developments that projected its utility into 35mm domains, in the minds of many who have not followed its progress closely, 16mm motion pictures are still thought of in terms of imitation rather than as successor to the larger films.

Some five years ago, in an effort to demonstrate the professional possibilities of 16mm pictures, the writer displayed a new projector at a convention of the Society held at Washington, D. C. It was pointed out then that the trend of design must give consideration to the professional rather than to the home field. As indication of this trend, a picture was projected with the machine that was displayed that almost filled a theatrical screen 14 feet in width, using only a 250-watt, 20-volt standard incandescent projection lamp, the projector being some 70 feet from the screen.

It is of particular interest to review the progress that has been made since that demonstration. Considering projection only, the most important improvement has been in illumination. Projection lamp design has made remarkable progress. Lamps of 1000-watt capacity are now available for 16mm use. Optics and film-moving mechanisms are far more efficient than formerly. Without any substantial increase in size or weight of equipment, the illumination today has definitely reached the auditorium stage. Five years ago it was a novelty to project a theatrical-size picture in an auditorium having a capacity of 500 persons. Today it is commonplace, and numerous instances can be found where the 16mm projector, formerly referred to as the "little brother of the 35," is being operated in projection booths in place of the larger equipment.

With this advance in illumination, the field of usefulness of 16mm projection has rapidly increased. Industry, which had long realized the value of 35mm films for sales and business purposes, found the improved 16mm equipment much more convenient than the heavier and more cumbersome 35mm projectors. In education, where extensive libraries of teaching films had been developed as visual aids, the 16mm equipment was quickly accented as the more desirable in view of its lack of fire hazards, lighter weight, and ease of operation. In non-theatrical fields, such as churches, clubs, lodges, and social groups, the 16mm equipment has increasingly become the favored standard for auditorium projection.

With the advent of sound, it looked at first as though the 16mm industry had found a real stumbling block. It

seemed incredible that satisfactory sound could be photographed and reproduced on the 16mm film, which operated at two-fifths the speed of the 35mm. It seemed impossible that the complicated mechanism of sound projection could be added in a compact and light-weight portable form to 16mm equipment and at the same time achieve comparable sound effects.

A short period followed in which the industry was frankly perplexed. It tried to effect a compromise by using synchronized disk records on an attached turntable for the sound. This did not prove to be a happy solution, and it was soon realized that 16mm sound production would have to march in the footsteps of the 35mm with the sound on the film, just as it did in projection.

Early work with 16mm sound-film had not been encouraging from the standpoint of sound quality. The limitations of film size and the slower linear speed for light-beam scanning resulted in substantial losses in 16mm sound reproduction as compared to 35mm. Radio had set a definite standard for sound quality, and it was generally conceded that 16mm sound would not be satisfactory until it reached, and preferably exceeded, the quality attainable with radio reproducers of the best grade.

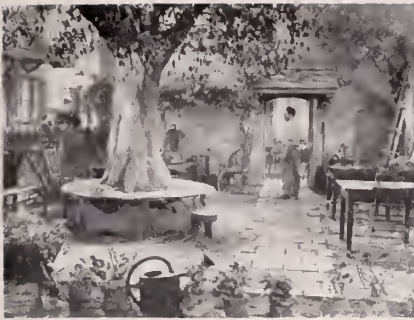
Meanwhile the revolution that sound had created in the 35mm field had its reverberations in the 16mm field. Insistent demands arose from the industrial, educational and non-theatrical fields that 16mm equipment provide the advantages of sound as well as the picture. Even the home field became to some extent dissatisfied with home movies without sound, and home talkies gave promise of large outlets for the industry.

Happily for 16mm movies, progress in sound recording advanced rapidly. With the advent of high-fidelity recording, with its greatly enlarged range of frequencies, in combination with great advances in optical reduction printing, the losses of 16mm sound-film became of lesser significance. Continued improvements finally made it possible to provide a quality of sound with 16mm film comparable to the best reproduction on high-class radio sets. A frequency range of 50 to 7000 cycles became possible, while output capacities of 15 watts or more, with negligible distortion, proved adequate for auditorium use.

Where is 16mm sound-film most extensively used at the present time? It is quite safe to say that industry is by far the largest user. Such representative large corporations as Chrysler Motors, Firestone Tire & Rubber Company, Portland Cement Company, Hormel Company, General Motors Corporation, and hundreds of others too numerous to mention, are utilizing 16mm sound for many purposes. It is being used as a sales medium to consumers, as a training medium for dealers and salesmen, and as an educational medium for employee instruction. The production

*Paper presented by Mr. A. Shapiro, of Ampro Corporation, at Spring meeting of S. M. P. E.

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Using Light To Help Composition

by

J. Belmar Hall,

Instructor, Department of Cinema,
University Southern California

WE often hear some cinematographer say that pointing with light is the most important thing in motion pictures. Well, that is true; he can take care of the close-up of the star with reflectors for all the effects he wishes to get, but when he is compelled to make the exterior scene in the studio he has to create the illusion of reality. Light is his medium; he must use it as the artist would his pigments, even if he is shooting in black and white he can get all the tones and subtle qualities that will have the psychological reaction to the audience mind that they are seeing on exterior. Atmosphere that is made up of light only, real trees placed in proper relation to the painted backing must blend into the whole through the light the cameraman allows to come through his lens.

In the first photograph at the top you will see how well the artificial tones are made to seem real. The gradations from the foreground to the subtle tones in the background are in true value to the real exterior. Light coming from above where it actually does in nature, but is soft and mellow so that the eye can feel in harmony with the scene. The artificial light, that is, that which comes from the lamp-post and through the windows, must show a contrast to the natural lighting. The bits of props that are placed about

this scene give it realism; the watering pot perhaps is its truest note, because some little thing like that makes one feel that people had actually been there working in the garden. The ladder at the side against the wall lends atmosphere. All pictures, day or night, are taken with the light coming from one angle; the reason is simple, natural light changes during the day, and as shots in the studio are taken at different times, the light source must be always the same to match with every scene. There must be no sudden jumps of light playing all over the scene. You could never sit through a picture if it was made this way.

Photos 2 and 3 are of the same scene; it is a little interior of an European inn, with careful study of light and design. The ceiling beams are shown with their ornamental design which is characteristic of such a place. The lighting is subtle and such as one would find in Europe. The arrangement of the chairs and tables are home-like. The little things placed on the wall sing their song. Now contrast it with the same scene cluttered up with garlands and streamers, tables looking like some American cafe, no unity in composition, lighting flat and meaningless, beams are lost in the jumble. It could be New Years in any city, but it never is, nor never could be, European. There is no painting with light, just a sorry mess. No indication of where the light might be coming from. Avoid this at all times and you won't regret it.

The first picture at the bottom on the left is typical of the sets made in major studios. Refinement, balance and good design. The furniture is in keeping with the massiveness of the architecture. Soft, mellow light through the large window is interesting and leads the eye to the stone arch entering on the rear of the room. The balcony stands out in relief against the archway with light coming from some other part of the mansion. The lighting fixture on the left side of the room is in keeping; the heavy drapes belong in this scene. People moving about this room even if it were today, would fit into such a place. The lighting is highly dramatic as the costumes worn in this picture were the accenting note. This is good composition.

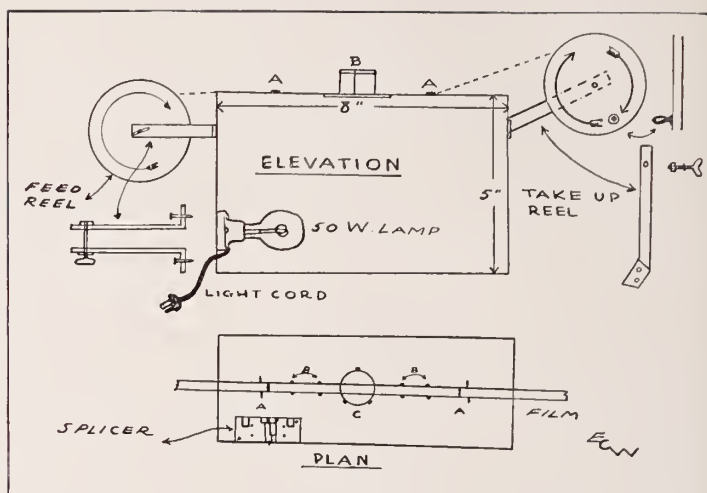
The next two pictures are in the "modern manner," French in fact. The lighting system used is real as for as

Continued on page 82



Making An 8 mm Film Viewer

by
E. V. Soderberg



The author has made his explanation of this gadget clear; but to further simplify it and make it more understandable he has given us the above sketch showing detailed construction of this viewer. A comprehensive reading of the article and consultation of the above outline drawing should make it possible, for anyone desiring to do so, to make this gadget without much trouble.

A SERVICEABLE film viewer can be made with a small cash outlay, and use of a few simple tools. Secure a wood box, approximately 4" wide, 8" long and 4" to 5" deep. The box used in the sketch was a card index file box with a hinged cover. If a box with a hinged cover is not readily available, use or make up a box, eliminating the bottom entirely as the interior need only be available to replace the lamp. The box should be planed and sanded to a very smooth finish and varnished.

Inside the box mount a standard porcelain socket, connect sufficient lamp cord to reach floor or wall outlet. A 50-watt Mazda lamp gives all the light required.

Make two brackets of heavy gauge metal (10 or 12 ga.) $\frac{3}{4}$ " wide—4 $\frac{3}{4}$ " long. Drill two $\frac{3}{16}$ " holes in one end, one $\frac{3}{8}$ " hole in the opposite end. Bend the ends (drilled $\frac{3}{16}$ ") at right angles $\frac{3}{4}$ " from the end. These brackets mounted with stove bolts on the box, as shown will accommodate the film to be viewed either 8mm 200-ft. reel or 50-ft. laboratory reel—a $\frac{1}{4}$ " bolt and a wing nut will complete this mounting. The brackets can be tightened against the reel to a desired tension with the wing nut.

For the take-up reel a single bracket was made of $\frac{1}{16}$ " brass 6" long drilled same as other brackets. This bracket may be bent the same as the others, but we found it desirable to bend it on about a 15 degree angle, as illustrated. This places the take-up reel higher, and is easier to operate in this position. A $\frac{1}{4}$ "x1" bolt with nut to fix it permanently and a $\frac{1}{4}$ " wing nut and washer for tension control on the reel are required.

The take-up reel itself we use is just an 8mm laboratory reel with the handle of a discarded fishing reel soldered on to it. A regular 200-ft. reel could be equipped in a like manner. For rewinding, after viewing and splicing, it is more practical to use the Kodascope.

The top assembly, where the actual viewing is done, is laid out as follows: After the brackets are mounted and squared in a direct line to each reel, draw parallel lines, the width of the film, between the feed and take-up reels.

(a) From thin brass or sheet metal cut the two guides for the film $\frac{1}{2}$ " wide—1" long. Bend them in the shape as illustrated in the sketch. Allow about $\frac{1}{8}$ " in height in the forming of these guides.

(b) They are fastened with wire brads to the top over the film path 2" from each end of the box, and covered with adhesive tape to protect the film from the sharp edges. Wire brads should be driven part way in, along each side of the film path, to guide the film accurately.

(c) Then in the center of the box and in the film path cut a slot approximately $\frac{1}{2}$ " long and the width of the film. On the underside of this slot paste a strip of paper mending tissue to diffuse the light. For the viewer magnifier I used a double lens mounted on three legs, as ordinarily used in biology classes at school, about a four power glass. A Tripod Magnifier, Eastman Catalog No. 31-63-01, may be used, and can be secured from any kodak dealer for 75 cents.

Three shallow holes were drilled in the top of the box, as indicated in the sketch, for mounting this glass.

Next thread a strip of test film through the guides dull or emulsion side up, so perforations will be on the right side. With the glass in place, make a mask of black paper for the light slot to cover three frames in length and masking off the perforations.

The viewer is then ready to connect to a light circuit. The distance of the eye from the eye piece is, of course, a variable factor, but 6" to 8" is best for the glass I use.

If the box is large enough, it will be convenient to mount the film splicer on one side. Film can be nicked with a pocket knife as it is viewed for proper splicing.

This viewer is, of course, designed for 8mm, but with necessary changes in measurements, could be adapted to 16mm.

The glass and mounting of it could be changed to suit what the constructor has available, but at least a four power magnifier needs to be used to obtain good results.

A. S. C. Extends Honorable Mention To Amateurs

LAST MONTH in addition to listing the 1935 Amateur Movie winners we also gave a list of the runners-up. It is only natural that those runners-up are highly deserving of honorable mention.

With only four classifications represented in last year's prize winners and with Documentary Class carrying the greatest number of entries, it is only natural that there should have been a great number of exceptionally fine entries in that class, many of which in a less representative and less important contest or classification would have been termed prize winners.

The Documentary Class took within its confines all pictures not built around stories or scenarios. This means that the scenics, travel, educational, industrial and others which were records of events or things were classed as documentary.

The entries coming from Japan would indicate that that country has gone 8mm. Not only was Okamoto's prize winner an 8mm, but a dozen or more from Nippan were shot in that size. However, outstanding for its novelty and idea was Tameyuki Sakamoto's offering of "Unknown Thing From Unknown Land." This was a story by animated drawings. It was of the fairy tale type, but well executed, well handled and convincingly portrayed. Sakamoto deserves special commendation for his patience and for the splendid completion of a very difficult task.

Honorable mention was also extended to J. Sherlock of Sydney, Australia, for his "Surf, Sand and Sunshine," a scenario picture of a day on the surf with a shark scare and a love theme welded into an interesting pictorial portrayal.

"Fishers of the Grande Anse" by Leslie P. Thatcher of Toronto, Canada, was a grand picture. While it might have been placed in the runners-up class, still the judges felt that only those should be placed in that class that held on until the very last ditch. "Fishers of the Grand Anse" missed by one hurdle. Honorable mention.

"Conscience," by Claude W. A. Cadarette of Los Angeles, received honorable mention for his 8mm scenario picture. This picture was a prize winner in the Los Angeles 8mm Club's annual contest.

"Creatures of the Past" was highly enjoyed. It is the work of C. E. Welsh and C. B. O'Donovan of Pittsburgh. They took as their models a display made by local and New York department stores. The manner in which they photographed led the viewer back centuries to the time when the prehistoric mammoth was on this earth. Honorable mention was accorded these cinephotographers for their work.

H. Oka of Japan was given honorable mention for his 8mm picture, "The Thrill of the Silver Crest Range," as was Y. Kaneko of the same country for his production, "Symphony Natural." Another honorable mention going to Japan was given to Tameyuki Sakamoto for his picture, "Country Life in Early Summer."

Six from Los Angeles received honorable mention. Franklin B. Skeele for his picture, "Hook, Line and Slickers." A record of a summer trip with humorous twists. Floyd Stone for a Kodacolor subject, "Once Upon a Time." Scen-

orio and subject matter were fine, but the photography rather under and dark. F. B. Judson for his Kodachrome picture, "The Story of Linetta." This was made in 2000-ft. for commercial purposes. H. A. Linek for his picture, "San Diego Exposition." This picture was given first prize in the Los Angeles Cinema Club annual contest. Van Dee Sickler for his picture, "Spunky." This was a sequel to his last year's prize winner, "Mischievous." It has the same characters, the dog, cat and bird with an addition to the dog and cat family. Alfred H. Orme for his picture, "The Reel Answer." Orme gave his picture a great deal of interest by the titling.

J. R. Derisowa received honorable mention for his 2000-ft. picture, "Nisei Parade." As a general rule it is difficult to maintain interest through five reels of pictures.

Delmar J. Frazier of Oakland, California, had a very fine picture in his 500-ft. subject, "The Incarceration of Marie Colet." It was well acted, well written and nicely handled. It was very deserving of the honorable mention which it receives. We might say he receives two honorable mentions. The other for his home movie subject, "Black Magic." This was a well thought out picture, but lacked a bit in photography to stack up with the prize winners. An ambitious effort was the entry of the Greater Oakland Motion Picture Club. Excepting for its finish, it was right up in the prize winning class. It receives honorable mention.

A. Scott Moorhouse of Toronto, Ontario, entered a combination black and white and Kodachrome subject in "Village by the Sea." This picture went very far in the finals and is highly deserving of the honorable mention it receives.

Bill Turnbull of Denver entered several 8mm subjects of the Chicago Fair. To our mind they were among the very best pictures of that event that had been submitted to us in the past two years. His pictures were well cut, nicely edited and deserving of honorable mention.

Joseph F. Hollywood of New York City entered "Opera Night," shot entirely indoors with some trick stop action built around his children. A deserving effort that receives honorable mention.

Helen and William Pryor of Falls Church, Va., entered an imaginative subject in their picture, "Anyia," which receives honorable mention.

Mrs. Anne Filut of Milwaukee, possibly entered the most ambitious undertaking to be viewed by the judges. Eleven reels of 8mm film on "Creative Work in Fractions," in which she clearly shows the principles of her subject and the fundamentals of the work she is teaching, taken in the class room with the children themselves as the actors. She was given honorable mention.

Konstantin J. Kostich of Long Island City receives honorable mention for his picture, "Bermuda, the Floating Gardens." Cinema Players of Chicago also received honorable mention for their 370-ft. picture, "Ten Easy Lessons."

Continued on page 82



Continuity For a Family "Thriller"

by
Barry Staley

HERE'S a little story built for a girl. It can be altered in some of its minor details to fit your conditions and facilities. Your imagination or observation of your child may dictate some changes and additions. But here's the story as we see it:

MAIN TITLE: THE GREAT KIDNAP MYSTERY—or, THE ANEMIC BLOODHOUND.

Scene 1: LONG SHOT of small daughter Ruth in backyard playing with doll. Rover, her dog, is in the scene.

Scene 2: CLOSE-UP of Ruth playing with her doll. She looks up toward the house.

Scene 3: MEDIUM SHOT of mother at back door of house calling and beckoning Ruth to come in.

Scene 4: CLOSE-UP of Ruth nodding that she has heard and carefully placing doll in chair.

Scene 5: MEDIUM-SHOT of Ruth leaving her doll and running to house.

Scene 6: MEDIUM-SHOT of mother still at back door. Ruth runs in to her. They enter the house.

Scene 7: CLOSE-UP from high camera angle of wash basin in bathroom. Ruth's hands come in, turn on tap, take soap.

Scene 8: CLOSE-UP from same high camera angle of Ruth's soap-sudsy hands rubbing together.

Scene 9: CLOSE-UP of folded towel on rack. Ruth's hands come in and wipe themselves dry. The little hands, pink and spotless, are held out for inspection.

Scene 10: MEDIUM CLOSE SHOT of luncheon table in diningroom, set for Ruth's lunch. Ruth comes in, takes her chair, begins to eat happily; she looks up and points to the window.

Scene 11: CLOSE-UP of window pane from inside. Rain is falling on it.

Scene 12: MEDIUM CLOSE SHOT of Ruth's doll in its chair. Rain is falling on the doll. Rover enters, takes doll in his mouth and exits.

Scene 13: MEDIUM SHOT of Rover carrying doll into his dog house.

Scene 14: CLOSE-UP of Rover placing doll down in nice dry place in his dog house.

Scene 15: CLOSE-UP of Rover looking out door of his dog house at rain falling outside. FADE OUT.

Scene 16: FADE IN on MEDIUM CLOSE SHOT of Ruth finishing her lunch. (Continuation of Scene 10). She looks up at the window.

Scene 17: CLOSE-UP of window. The rain has stopped, the sun is coming out.

Scene 18: MEDIUM SHOT of Ruth leaving the table and skipping out from the diningroom.

Scene 19: MEDIUM SHOT of Ruth scampering merrily out the back door.

Scene 20: MEDIUM CLOSE SHOT of the vacant doll chair. Ruth runs in and notices the absence of her doll.

Scene 21: CLOSE-UP of Ruth looking about for her missing doll. She sees Rover and calls him.

Scene 22: MEDIUM CLOSE SHOT of Ruth as Rover comes running to her. Ruth leans down and talks to Rover.

TITLE: "Dolly musta been kidnapped. Let's go find her."

Scene 23: CLOSE SHOT of Ruth holding Rover's nose to the doll chair so he can pick up the scent.

Scene 24: MEDIUM CLOSE SHOT of Ruth attaching leash to Rover's collar. She motions Rover to lead the way to missing doll. Rover starts away with Ruth, leash in hand, following.

Scene 25: MEDIUM SHOT of Rover leading Ruth across the yard. He is hot on the trail.

Scene 26: MEDIUM CLOSE SHOT of trash can heaped with old tin cans and such. Rover leads Ruth to trash can, leaps up barking. Ruth tosses out the cans in search of her doll.

Scene 27: MEDIUM SHOT of Rover leading Ruth away from trash can. Old tin cans, boxes and refuse are strewn about the ground where Ruth tossed them. Her hands, face and dress have become soiled.

Scene 28: MEDIUM SHOT of Rover straining at leash leading Ruth out the backyard gate.

Scene 29: MEDIUM SHOT of Rover leading Ruth along sidewalk. Rover suddenly jerks forward barking furiously. Ruth holds tightly to the leash.

Scene 30: CLOSE-UP of cat in a tree.

Scene 31: MEDIUM CLOSE SHOT from low camera angle. Rover is jumping up at the tree, barking gayly.

Scene 32: CLOSE-UP of the cat in the tree, spitting and hissing.

Scene 33: MEDIUM SHOT of Ruth pulling Rover away from the tree and bidding him resume his trailing.

Scene 34: LONG SHOT of Rover, nose to ground, leading Ruth across an open field.

Scene 35: MEDIUM SHOT showing the remains of a bonfire in the open field. Rover leads Ruth to it, sniffs and starts digging with his front paws.

Continued on page 84



Simple wipes are easily understood, but the one at the left is confusing.



Fancy transitions like this are tricks, and should be used sparingly.

How About Your Transitions?

by
Walter Blanchard

THE other day I was telling my friend Gus about some of the excellent transitions I saw in the prize winning contest pictures. "That's all very interesting," he replied, "but why preach about it to me? I just shoot home-movies for fun—my pictures haven't anything to do with transitions."

That's where Augustus was wrong. Like many another movie-maker, he has transitions in every roll of film he shoots, whether he knows it or not. Every time you change from one thought or location in your picture to another, the change must be made by some sort of a transition. A direct cut from one shot to the next is just as much a transition as the most elaborate dissolve or "wipe." Good transitions lend smoothness to any kind of a picture; some of the best ones in the contest were in "Happy Days," the Home Movie Class winner, which told of a little boy's picnic afternoon at the beach.

The simplest transition is the direct cut. It is also the most abrupt. Where the change of thought or place is not too great, or when you are keeping a fast tempo, direct cuts from one sequence to the other, can be used safely. But as a general rule, direct cuts should be avoided as transitions because they are so abrupt that the audience has no time to make the mental readjustment necessary in changing from one idea to another.

The fade-out and fade-in are smooth and positive. When you see a picture fade out on a sequence, you know without thinking that that is the end of the sequence. Fading in on the next sequence completes the smooth change from one line of thought to another.

The lap-dissolve, speaking technically, is just a continuation of the fade-out and fade-in idea. It is beautifully smooth—and that's the weakness of the dissolve; it's so

smooth that you can't use it to connect sequences that aren't closely and clearly related. The lap-dissolve inherently suggests that the two ideas are closely related; dissolving from one idea or place to another not closely allied to it is almost as abrupt as a direct cut—and sometimes even more confusing, because the audience is less conscious of the dissolve.

The "wipe" is a tricky sort of transition. There are so many different kinds of wiping transitions possible that no general rules can be laid down. The simplest wipes, in which a dark area wipes the first scene from the screen, and is in turn wiped away as the second scene appears, is almost as deliberate and final as a fade-out followed by a fade-in. On the other hand, wipes in which one scene pushes the other off the screen are almost as abrupt as a cut. In addition, the wipe is rather of a trick-shot, and most of them call attention to themselves rather loudly. The best transitions are those which quietly bridge the gap between one sequence and the next, without diverting the audience's attention from what you are telling to how you are saying it.

Tempo plays a very definite part in using transitions. A quick fade-out and fade-in not only sets a faster tempo than a slower transition of the same type, but also suggests a more intimate relationship of the ideas in the two sequences. A long fade out and fade in transition sets a more deliberate tempo, and suggests that the two sequences are further separated in thought, place, or time. The fade out and fade in combination, incidentally, is the surest way of bridging changes in tempo between two sequences.

The length of a lap-dissolve also has an important bearing on tempo. A short fast lap gives a fast tempo, but it is often so quick as to be confusing. A more deliberate blend is better for most normal purposes. At the other extreme, ultra-long dissolves slow the tempo, but again at the price of confusing the audience. In "Dishonored," Josef von Sternberg, A.S.C., used lap-dissolves as much as 200 feet in length. They gave him the slow transition he wanted all right, but they were so darned gradual that most audiences left the theatre wondering what it was all about!

Wipes can be made in any tempo, depending on the nature of the wipe used. They can be slow and deliberate, or they can be speeded up until the transition is almost as quick and abrupt as a direct cut. They lend themselves well to rhythmic presentation, especially if the picture is synchronized to music.

But the photographic side of transitions isn't by any means the only thing to be considered. Not only is how you make your transition important, but from what and to what you change. The shots leading up to a transition, and from it into the new sequence, are vitally important. They are what decide whether your film is to be a clever, smoothly-flowing picture, or just another amateur movie.

In "Chronicle," there were several good transitions. At one point, for instance, it was desired to show that while the boy's mother was carefully keeping his birthday cake for him, he was out getting drunk at a wild party. This transition was made by showing a series of close-ups of the mother's hands smoothing his empty bed, setting his alarm clock, and finally putting a napkin over the untasted birthday cake. From this shot, a short lap-dissolve changed the scene to a close-up of a napkin being removed from a wine bottle. Then, going from this by direct cuts, the party sequence continued.

Some of the best transitions in the contest, though, were in "Happy Day." The picture begins with the family's breakfast. Then the father announces that, as the weather



WHEELS OF INDUSTRY

Eastman Pala-Screen

● The troubles which photographers have in shooting scenes in which oblique glare from some polished surface obliterates details or in which appears the reflection of objects not intended to be in the picture, have been solved by a new photographic device announced by the Eastman Kodak Company. It is called a Pala-screen and looks like an ordinary lens filter but has properties that seem truly magical in their operation.

Look through a Pala-screen at a plate glass window showing the oblique reflection of the other side of the street, rotate the mount and the reflection disappears. You may then see clearly through the window. Or, as another example, if the glare from an oil painting is so intense that you can scarcely see what it is, look at it through a Pala-screen, the glare vanishes and the subject is revealed. Similarly with the design in a tile or linoleum floor.

This device is a practical application of the fact that light rays normally vibrate in all directions at right angles to the ray itself but under some conditions become "polarized," meaning that all directions of vibration but one have been stopped. This occurs in oblique reflection, and in the light coming from a clear blue sky.

The Pala-screen is made of a transparent sheet polarizing material in which is dispersed a countless number of minute, parallel, rod-like crystals that act as optical slits and which is cemented between glass plates in a holder to put over the camera lens. When the screen is rotated, the direction of vibration of the transmitted light is rotated and at a certain position the polarized light is absorbed and thus cut out of the picture.

Tests of this device by Hollywood motion picture photographers have shown that Pala-screen shots of water can be made which subdue glare and reflection from the surface, showing rocks, fish, divers or other objects under the water through a considerable depth. Undesired reflections from highly polished sides of automobiles and other glossy surfaces which give the photog-

rapher trouble are similarly subdued, and without affecting the rest of the picture. The use of the Pala-screen when photographing subjects against a blue sky gives remarkable effects in darkening the sky and permits considerable control of the relative brightness of walls and roof in architectural pictures.

The Pala-screen is equally useful in still or motion picture photography.

16mm Sound Release

● "Three Centuries of Massachusetts" has just been released as a 16mm. sound-on-film motion picture by the Bell & Howell Filmsound Rental Library.

Prepared under the direction of Professor Albert Bushnell Hart of Harvard, its eight reels depict events, personalities, and incidents which, because they figured in the history of Massachusetts, are chapters from the history of the Nation.

Professor Hart himself furnishes an interesting running narrative for the picture, telling the story of three hundred years of history, from the Pilgrims' first glimpse of the sand dunes of Cape Cod to the departure of the present-day plane for New York.

The picture is made up of eight separate episodes, one reel being devoted to each episode, with a separate subtitle, as follows: Reel 1, General Introduction; Reel 2, Colonial Life; Reel 3, Salem Witches and Shipbuilding; Reel 4, The Revolution; Reel 5, The Rise of the Sea Trade; Reel 6, The Rise of Arts, Education, and Industry; Reel 7, The Rise of Steam Power and the Civil War; Reel 8, Modern Massachusetts.

Cartoon Controversy

● Alleging violation of copyright, Exclusive Movie Studios, Inc., 732 S. Wabash Ave., Chicago, and Paramount Productions Inc., from whom they hold a contract as exclusive distributors of animated cartoons featuring "Popeye," "Betty Boop" and others, have entered a Bill of Complaint against the Leader Motion Picture Film Company of New York City.

Among the films mentioned in the bill are "Popeye the Sailor," "Betty Boop's Birthday Party," and others which have been presented and directed

by Dave and Max Fleischer. All have been copyrighted by Paramount Productions, Inc., with Exclusive Movie Studios, Inc., having rights to manufacture and distribute them through wholesalers and retailers in the 16mm size for home movie projectors.

According to Exclusive Movie Studios, Benjamin Leder and Nathan Leder of the Leader Motion Picture Film Company, New York, wrongfully obtained a quantity of the copyrighted film, and have manufactured and distributed the infringing films.

The bill asks specifically that the defendants be subpoenaed to answer the complaint and be perpetually restrained from duplicating, duping, or distributing films containing any of the details, images or symbols used in the copyrighted works.

New 8mm Lens

● Bell & Howell Company announces as available for both the Straight and Double 8mm Cameras a new 1-inch F 2.7 Taylor-Hobson Coake lens in either universal or focusing mount; also Taylor-Hobson fast 1-inch F 1.5 lens in focusing mount.

Announced at this time, too, is a new Taylor-Hobson Cooke "semi-telephoto" lens, the 1½-inch F 3.5. This completes the range of lens focal lengths provided for by the viewfinder masks on Filmo 8mm Cameras. If longer lenses are desired, such as 2-inch, 3-inch, and 4-inch, Taylor-Hobson 16mm camera lenses of these focal lengths may be mounted suitably for use on the 8mm cameras.

The 12½mm F 2.5 lens will continue as standard equipment on the Filmo 8's.

16mm French Releases.

● "Crime and Punishment," imported from France, has been released today on 16mm soundfilm by the Garrison Film Distributors Inc. The 16mm copies will carry over 600 English super-imposed titles.

The release on 16mm sound-on-film follows the selection by the National Board of Review of "Crime and Punishment" as one of the ten best European films of 1935.

Continued on page 83

EASTMAN PRESENTS

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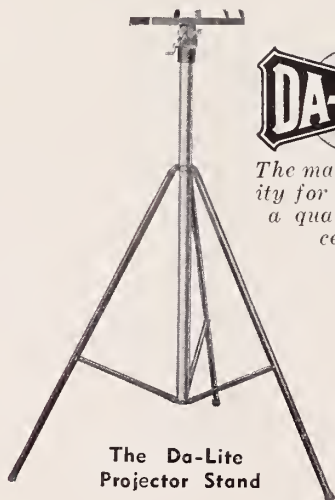
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Musical Scores for Prize Pictures

Continued from page 69

he did so without bringing about a bit of unnecessary complication in his score. He used but three records—and they provide as perfect-fitting a score as though he had used thirty! The introductory sequence is scored with "Deer Dance," Victor Na. 22174. As the pioneers' wagon-train appears, the music swings to "Oh Susanna Medley," Brunswick Na. 4569, changing to "Butterfly Dance," an Omaha Indian dance-theme, on the back of the first record, for the Indians' war dance. As the pioneers camp, "Oh Susanna" is repeated. Then, as the Indians attack, Wagner's "Ride of the Valkyries," Victor record Na. 1963, provides the theme for the bottle which finally wipes out the wagon train, and a repetition of the "Butterfly Dance" accompanies the epilogue sequence.

Properly to present such musical accompaniments requires a double-turntable reproducer, which need not be synchronized with the projector. It is easy enough to start your first record at the same time the projector starts; from then on, it is just a matter of knowing your cues for record changes, and following them. (For safety, have your cue-sheet written clearly!) The records should be arranged in order, and placed so you can get them quickly. The used records should be stacked on another part of the table, if there's room, or stand edgewise in a box or case, if space is cramped. If your records are good, don't try to play more than one disc with a single needle, for the first few turns in a record contain an abrasive that shapes the needle to the groove of that particular record. If, however, you are going to play two sides of the same disc on the same turntable, you needn't change the needle, for in most cases, both sides are cut with the same tool, and the needle, once fitted, would fit both grooves.

If it is at all possible, place yourself where you can hear the sound from the speaker fairly well; otherwise, guessing as to the proper "fader" (volume-control) setting, you are likely to give your audience too much or too little sound, as different records are recorded to different volume-levels. Often you can heighten the effect by raising or lowering the volume for different scenes. For narrative titles, such as those in "In the Beginning," it is often good to use slightly more volume than when pictures are on the screen.

A dual turntable outfit would undoubtedly help when creating the score, but in my own case, I found that a very ordinary projector and phonograph were quite adequate. I would start the two together, and play the first record. Then I'd stop the projector while I changed records, starting disc and film together again. This is accurate enough



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far most purposes, though you must make allowance for the fact that it isn't perfectly accurate, and that with a dual turntable outfit, your record changes can be almost instantaneous. When you are playing only parts of a record, it helps a lot to have a calibrated arm on the pickup-support, so that you know

you'll be starting at the right point each time. Above all, don't overlook the importance of thorough rehearsal, and a good understanding with your projectionist, for he can ruin your score by running his machine faster or slower than you did when you built the accompaniment!

Trend in 16mm Projection, with Special Reference to Sound

Continued from page 70

of these industrial 16mm sound pictures has become a large industry in itself, and a constantly increasing supply of film for such purposes is being made.

The educational field, which had already recognized the silent picture as one of the most valuable aids to visual education, recognizes in the sound picture a still more effective aid. However, the library of educational sound-films is still relatively small. The educational field is only awaiting the increasing of this library to take an 16mm sound in an extensive way. Even with the present small library, hundreds of schools are already equipped with 16mm sound projectors in the expectation that sound libraries will quickly and greatly increase.

The addition of sound to 16mm film has given the church, the club, and other non-theatrical fields a great stimulus. Circulating libraries of 16mm sound-film are now operating in a number of large cities, and rental rates are but slightly higher than for silent films. About 1000 subjects of entertainment character are now available, and this number will undoubtedly increase rapidly. This will, in turn, greatly increase the demand for equipment.

The home talkie field likewise is dependent to a considerable extent upon the further development of suitable libraries of rental sound-film. The introduction of a 16mm sound camera for amateurs has stimulated a corresponding demand for sound projectors. The higher cost of such equipment, however, has prevented its more general use. With lower costs, based upon designs particularly adapted for home use, this field will no doubt broaden considerably.

We come, now, to a consideration of what lies ahead for 16mm sound. We have seen how it quickly outgrew its original limitations, and with its increased light power, advanced into 35mm territory for industrial, educational, and non-theatrical purposes. In these fields, it unquestionably has tremendous unexploited possibilities, but, can it not go farther?

What about the theatrical field? Has 16mm projection a destiny in the thous-

ands of moderate-sized theaters? The answers to these questions seem to depend upon two factors: one, the ability of 16mm equipment designers to improve their products further; the other, the attitude of film producers toward furnishing their releases on 16mm sound-film, so as to enlarge the available entertainment film library.

The rapid progress made to date in 16mm equipment design and illumination gives every promise that the first factor will be attained. Already hundreds of performances are daily being given on 16mm equipment to groups up to 1000 persons, showing pictures upon large screens. In most cases, the audience is hardly aware that the equipment used is not 35mm. The lamp manufacturers have for some time given serious consideration to improving the illumination further, and experimenting with such lamps will undoubtedly result in a tremendous gain in 16mm illumination. Likewise, sound improvement has already enabled 16mm equipment to fill the requirements of moderate-sized theaters.

With regard to the second factor, the producers have so far been apathetic to releasing prints on 16mm sound-film. This has not only retarded the 16mm growth in the theatrical field, but has hampered the growth in the non-theatrical and other fields requiring entertainment film. Whatever the reasons for this attitude may be, it is certainly not justified upon the basis of a comparison of operating factors between 35 and 16mm films.

For example, compare the factor of safety between the two films. While 35mm film of a non-inflammable type can be obtained, by far the greater amount used is extremely inflammable. Many cities recognize the fire hazard this poses and require fire-proofed booths for 35mm projection. All 16mm film is non-inflammable or slow burning. Its safety has been recognized, so that no restrictions prevent its use, even in the open. As an instance of this great advantage, it is cited that in many schools children operate the 16mm equipment. This can hardly be said of

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35mm film, which has a definite fire hazard.

Again, the 16mm equipment requires no special prolonged training for competent operation. Again citing the experience in schools, it is found that such equipment is generally operated by the teachers or by their pupils. Its small size and weight enable it to be easily transported, thus encouraging its use in many places. This is a definite increase in its utility for road shows and circuit entertainments. Its simplicity results in substantial operating economies.

Another factor that offers an interesting comparison is the cost of distribution. A 1600-ft. reel of 16mm film weighs 5 pounds, and such a reel can deliver an uninterrupted program lasting 44 minutes. A 1000-ft. reel of 35mm film weighs about 6 pounds and can deliver a program lasting only 11 minutes. In other words, the weight of a similar program is more than four times as great on 35mm film as on 16 mm film. What a tremendous saving in shipping alone, besides the savings in container, packaging, handling, etc.

Finally, there is the economy of equipment. Not only is 16mm sound equipment far less expensive than 35mm; but, in addition, the theater can very often get along with one 16mm projector, whereas it would require two 35mm equipments. Since the 1600-ft reel of 16mm film can deliver a program equal to that of four 35mm reels, the projector need be re-threaded only once during an eight-reel program. This is not objectionable in the smaller houses, which, with 35mm film, would require two projectors; otherwise, there would be seven interruptions in an eight-reel program.

These considerations of lower costs are of vital importance to large numbers of the smaller theaters located in outlying sections. Their operating expenses have become disproportionate to their reduced incomes, forcing a number to close. In spite of considerable improvement in the theater business, some 3000 small houses are still closed. In many cases, the lower cost of 16mm sound-film would enable such theaters to reopen upon a profitable basis. This, in turn, would increase the revenue of the film producers, who are now limited as to the number of theaters that can profitably take their releases.

To summarize, it would appear that the immediate expansion of the 16mm sound market lies in industry, education, and non-theatrical fields. Film sources to supply these fields are growing rapidly. Industrial film producers are increasing their 16mm sound productions, several universities are producing 16mm sound educational pictures, and entertainment libraries are growing to supply the non-theatrical and home fields.

The future trend, with regard to the smaller theaters, is problematical. It



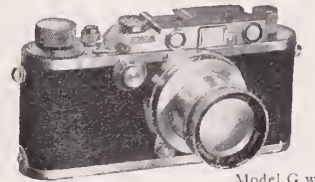
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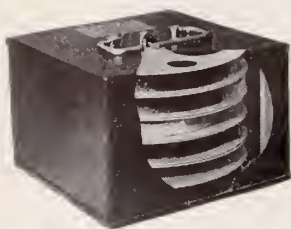
will require producer cooperation as well as improved equipment design. With such cooperation, the smaller theaters with capacities of approximately 600 persons and screens about 18 feet in width, which represent about 70 per cent of the total theaters in this country, can operate upon a more profitable basis than by using 35mm sound-film.

All indications point, however, to the trend of 16mm sound toward professional pursuits. It has outgrown the home field as a major outlet. It is destined more and more to be used as a tool for industry, as an effective aid for education, and as a flexible medium for cultural and recreational activities.

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Light and Composition

Continued from page 71

the concealed fixtures are concerned. The overhead lighting would certainly help any actor walking through the doorway. The highly polished floor adds a note of its own. This is texture in its proper relation and with the metal furniture they too belong. The lost photo is a very fine textural composition; the wall of the penthouse opening onto the roof is very definite in character. The sculptured panel fits into the design perfectly; the polished floor of the roof is odd but lends dignity and richness to the whole atmosphere of the scene. The arrangement of the trees in the background balances with the composition. The rail in the righthand background breaks the massiveness of the retaining wall running around the roof. The furniture is well placed for cinematic action, not too much of it, but what is there, is good.

The amateur would do well to study the pictures of stills from Hollywood and see that in most cases they are very well thought out in composition and textural qualities. The lighting is dramatic and well chosen and detail is all important to the type of picture. When you are making your home movie don't try to light up your interiors like the proverbial Xmas tree; it is not the amount of light that makes a good picture, but the care as to how it is handled. Move your light about until you have found the best place for your dramatic action and then shoot. From time to time you will see light plots diagrammed; they are for particular cases, so don't hold fast to the rule that there is only one way to get good lighting. Experiment and you will soon find that many new lighting plots will come up. Chart each one after you have made the shot; you may need this some time, and all plots should be filed away. Write in your problems and I will be glad to assist you.

**A.S.C. Extends Honorable
Mention to Amateurs**

Continued from page 73

Honorable mention was also accorded the following:

B. Fredric de Vries of Rochester, N. Y., for his picture "Hunting With a Comero Instead of a Gun." This picture was made practically in its entirety in the zoo. Edw. A. Bollinger of Buffalo for "Land of Ultimo Thule." George R. Mercader of San Antonio, Texas, for "Bullfight." J. E. Walters of Lafayette, Ind., for "Industrial Applications." Duncan MacD. Little of New York City for "The Making of Conodion Homespun." Frank E. Gunnell of West Brighton, N.Y., for "Adirondack Adventure." Robert M. Coles for his "Y West Side," and

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"Rocky Mountain Adventures." Coles has a fine sense of composition. J. Oliver Tucker of San Francisco for "Yucatan." Howard Demarest for "Staff of Life," and Mark A. Borgatta for "Ghost Town."

"Ghost Town" was highly appreciated by those directors and cameramen sitting on the judging board who had once worked in New Jersey. This picture shows all of the deserted movie studios in New Jersey.

How About Your Transitions?

Continued from page 75

is fair, they'll spend the day at the beach. Of course, the household work must be done first—the dishes washed, and so on, before the picnic starts. After several shots showing these chores being done, Mr. Lawrenson used a close-up of the washed and dried cups being put away. This was shot from above. A short dissolve then brought us to a close-up (made from almost the same angle) of the baby's tin sand-pail—and we knew the family was ready to leave.

But logically, a good deal of time must elapse between the time the family leaves the house and the time they arrive at the beach. There is nothing to be gained by showing them on their way—in fact, you never know whether they went to the beach by car, train, or afoot and it doesn't matter in the least. With the camera set up in the hallway, the family is shown to leave the house. Finally the front door closes, and blots out the whole screen. The screen is dark for a moment, then a crescent of light appears at the top, and grows larger; and you see that little "Ian," in his dark bathing-suit has been standing close in front of the camera, and is now walking forward with his daddy, to wade in the ocean.

With the lunch finished, a donkey-ride stall intrigues the youngster, and we have a cute sequence showing him riding the burro. This is one of those transitions where direct cuts can be used between two sequences. The picnic lunch is one definite idea, the donkey-ride another; but they are closely related in time, place and mood. So we have a medium shot of the baby finishing his dinner. He looks up, and points to something out of the picture. A direct cut changes the scene to a long-shot of the donkey-stall. The next shot—a closer one—shows Ian and his Mummy approaching the donkeys, ready for a ride. The transition is quick, but not abrupt.

Eventually, the picnickers start homeward. After a long happy day at the beach, a two-year-old just naturally is growing tired and it's a long way home. So Mr. Lawrenson showed us the business of picking up the sand-pail, shovel, and lunchbox, and the start home. Then he dissolves into a close shot of the feet of the three, walking along the pavement; the baby feet are dragging. Another dissolve, and we see them dragging still more, until Daddy turns about, walks back and picks him up. Another

dissolve and we see them entering the house.

Soon after the picnickers get home, a shower falls. We see the baby watching the rain through the window: it comes down harder and harder. Finally we have a close-up of the water gushing from a drainspout, from which we lap-dissolve to a close-up of a bathtub faucet running for the little boy's bath. After the bath, a dissolve from a close-up of the spiral swirl as the tub empties to a vertical close-up of milk being poured into a cup, and we know that "Ian" is having dinner.

These are only a few of the clever transitions Mr. Lawrenson has used in his picture. By all means—and especially if you have felt, as Gus did, that transitions had no part in home-movie making—see "Happy Day" when your club shows the 1935 Prize Pictures!

Wheels of Industry

Continued from page 75

Bee Bee Neck-Pod

● A new and convenient photographic accessory, distributed by Burleigh Brooks of New York, the Bee Bee Neck-Pod, is announced. The tripod extends to three sections reaching a length of 12 inches. (Closed, 5½".)

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John Boyle, A.S.C. Touring Europe

John Boyle, A.S.C., who last year contracted with the Associated Talking Pictures, Ltd. of London, as director of cinematography, left London right after the first of the year for a jaunt through Europe and Northern Africa.

Boyle flew via the Imperial Airways for Cairo via Paris, Rome and other points. On his return trip he will fly via Athens, Budapest, Austria, Switzerland and Germany.

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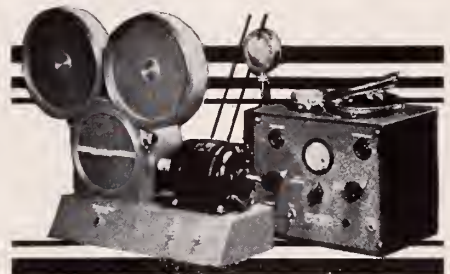
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Continuity for a Family "Thriller"

Continued from page 74

Scene 36. CLOSE-UP of Rover digging. The dirt is flying madly.

Scene 37. MEDIUM CLOSE SHOT of Rover and Ruth. Ruth has caught much of the flying dirt. Rover proudly unearths an old dirty bone. Ruth yanks at the leash and orders him back to the trail.

Scene 38. MEDIUM SHOT of Ruth, now quite dirty and very much disgusted pulling the objecting Rover along a sidewalk.

Scene 39. MEDIUM SHOT of Ruth returning to her back door, still pulling Rover, and meeting her mother with this report—

TITLE: "Mummy, Rover's no good as a bloodhound—or else he's awfully anemic." Fade Out.

Scene 40. FADE IN on Mother taking pan of food to Rover in his dog-house. It is evening.

Scene 41. CLOSE-UP of Rover sound asleep, Ruth's doll securely wrapped in his protecting paws.

Scene 42. MEDIUM SHOT of Mother putting down pan and then taking Rover and the doll in her arms and leaving for house.

Scene 43. MEDIUM CLOSE SHOT of Ruth in her bed for the night. Mother enters with the doll and Rover, hands doll to Ruth.

TITLE: "Rover took dolly in out of the rain—he's bringing it back to you."

Scene 44. MEDIUM CLOSE SHOT of Ruth hugging her doll, and waving Rover away. Mother turns down the night lamp.

Scene 45. CLOSE-UP. In dimmed light, Ruth is sound asleep, the doll firmly clasped against her face on the white pillow.

The performance of your dog rests on how well trained he is. But any dog can be led through this simple action by the judicious use outside camera lines of an inviting portion of hamburger or other dog delicacy. If a trail is laid by drawing the meat along the ground, the most mongrel pup will follow it expectantly. For the interior shot of the dog-house, made a simple "set," an old blanket folded and laid in a shallow wooden box. When your dog is sleeping, place the doll in his paws close to him for Scene 41. A garden hose will always provide the effect of rain. All of the scenes can easily be taken and they can be varied considerably according to your facilities and the available "locations" in your neighborhood for the hazards of the chase.

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The rules will be the same as last year. You can enter either 8mm or 16mm film. 35mm film will not be accepted in this contest, nor will reductions from 35mm film be allowed.



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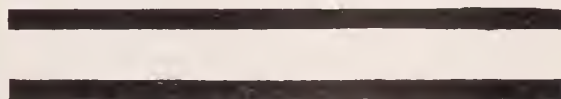
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Volume 17 March, 1936 Number 3

What to Read

Training Makes Triumphs by Harry Burdick.....	96
Making Pictures in England by Lloyd Knechtel, A.S.C.....	97
Rapid Processing Method by H. Parker and J. I. Crobtree.....	98
Problems of Controlling Correct Photographic Reproduction by Dr. Herbert Meyer, A.S.C.....	100
Making Clouds to Order Pays by Wolter Scott.....	101
News of the Month.....	108

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Smith, Leonard
Snyder, Edward J.
Sparkuhl, Theodor
†Steiner, William, Jr.
Stengler, Mack
Stout, Archie J.
Strenge, Walter
Struss, Karl
Stumar, John

Taylor, J. O.
Tetzlaff, Ted
Thompson, Allen Q.
Thompson, William C.
Tobey, Robert
Todd, Arthur
Toland, Gregg
Tover, Leo
Towers, Richard
Trego, Chas. T.
Tutwiler, Tom

Valentine, Joseph A.
*Van Buren, Ned
Van Enger, Willard
†Vander Veer, Willard
Van Trees, James
†Vargas, Ariel
von Sternberg, Josef

Wagner, Sidney C.
Walker, Joseph
*Walker, Vernon L.
Warren, Dwight
Warrenton, Gilbert
Wenstrom, Harold
Wetzel, Al.
Wheeler, William
White, Lester
Williams, William N.
Wimpy, Rex
Wrigley, Dewey
Wyckoff, Alvin

†Zech, Harry
†Zucker, Frank C.

Operative

Cinematographers

Ahern, Lloyd
Albert, C. L.
Anderson, Don
Anderson, Wesley
Arling, Arthur E.

Badaracco, Jacob
Bader, Walter
Bell, Jack C.
Bennett, Guy M.
Bennett, Monroe
Bentley, Fred
Biroc, Joe
Blackstone, Cliff
Booth, Frank H.
Boyce, Rube
Bradley, Wilbur H.
Brannigan, Thomas
Burks, Robert

Castle, Walter H.
Chewing, Wallace
Clark, Roy
Cline, Wilfrid M.
Cohen, Edward J.
Collings, Russell D.
Cortez, Stanley

Davis, Harry
Davis, Leland E.
Diamond, Jas. R.
Drought, James B.
Dunn, Linwood G.

Eslick, LeRoy
Estabrook, Edw. T.

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Feindel, Jockey
Fetters, C. Curtis
Finger, Frank
Finger, John
Fischer, Herbert J.
Fitzgerald, Edward
Fredricks, Ellsworth

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Green, Kenneth
Greene, Al M.
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Guthrie, Carl

Hallenberger, Harry
Harlan, Russell
Harper, James B.
Harris, Emil
Heckler, Wm. G.
Henderson, Edward
Hoag, Robert
Huggins, L. Owens

Irving, Allen E.

Jennings, Louis E.
Jones, Allyn C.
Joyce, Michael T.

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†Kelly, Wm. J.
Kesson, Frank
Knott, James

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Lane, Al L.
Lanning, Reggie
LaShelle, Joseph
Laszlo, Ernest
Lawton, Charles C.
Lerpae, Paul K.
Lindon, Lionel A.
Love, Cecil

Marlatt, Mark W.
Marta, Jack A.
McCormick, John T.
Meade, Kyrne
Merland, Harry
Metty, R. L.
Mols, Pierre M.
Myers, Albert

Newhard, Guy J.
Newhard, Robert S.
Nogle, Geo. G.
Novak, Joe

Palmer, Robert
Pierce, Otto
Pittack, Robert
Pyle, Edwin L.

Ramsey, H. Clark
Ramsey, Ray L.
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Redman, Frank
Ries, Ray
Roberts, Albert G.
Roberts, Josiah
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Schoedsack, G. F.
Shipham, Bert
Smith, Ernest F.
Smith, Harold I.
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Sullivan, Wm. F.
Surtees, Robt. L.

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Vogel, Paul Charles
Vogel, Willard I.

Webb, Harry
Wester, Carl
White, Ben
Wild, Harry
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Williams, Al E.
Williamson, James

Young, Jack R.

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Abbott, L. B.
Abramson, Melvin
Adams, Eddie
Adams, Ralph G.
Andersen, Jack
Anderson, Eddie
August, Joseph S.

Babbitt, Royal F.
Baldwin, Herold
Barber, E. C.
Barth, Willard
Beckner, Neal
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Bessette, Raoul
Boggs, Haskell
Bohny, Chas. R.
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Bridenbecker, Milton
Brigham, Donald H.
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Burgess, Frank
Burke, Charles

Cairns, Lawrence
Caldwell, John C.
Carney, Harold F.
Carrer, Ellis W.
Citron, Joseph A.
Clothier, William H.
Cohan, Ben
Cohen, Sam
Collins, Edward C.
Crane, Chas. M.
Crawford, Lee
Crockett, Ernest J.
Cronjager, Henry, Jr.
Crouse, John
Cruze, Warner
Curtiss, Judd

Daly, James
Dalzell, Arch R.
Davenport, Gene L.
Davis, Mark
Davis, Robt. D., Jr.
Daval, Richard S.
Dowe, Harry
Dawson, Fred
DeAngelis, Louis
†De Castzellaïne, Paul
Deverman, Dale
Diskant, George
Dodds, Wm.
Doran, A. Richard
Dorris, Joseph
Dowling, Thomas L.
Dugas, Frank
Dye, Geo., Jr.

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Eckert, John
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Epstein, Jack J.
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Horslev, D. S.
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Hyland, Edward

Ivey, Jesse

Jolley, Wm. A., Jr.
Jones, Edward C.

Kaifer, Fred E.
Kauffman, R. King, Jr.
Kearns, Edward
Keller, Alfred S.
Kenny, Jack
King, James V.
Klein, Irving
Kluznik, Matt
Koffman, Jack
Kunkel, Lou E.

Lackey, Walter K.
Lane, Art
Laraby, Nelson
Larson, Vernon
Lathrop, Philip
Leahy, Chas. P.
Lebovitz, Alfred
Lepree, Carl
Lewis, C. L.
Liggett, Eugene
Lockwood, Paul
Lykins, Vollie Joe

Mack, Robt. H.
MacBurnie, John
MacDonnell, Stanley
Marble, Harry
Margulies, Bill
Martin, John
Martinelli, Enzo
Mautino, Bud
McDonald, Frank
McEdward, Nelson C.
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Meade, Kenneth
Mehl, John
Mohn, Paul
Molina, Luis
Moore, Bernard
Moreno, Robert C.
Morris, Thomas C.

Nickolaus, John M., Jr.
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Norton, Kay

Orsatti, Alfred

Parkins, Harry
Perreault, Oliver D.

Rankin, Walter
Reinhold, Wm. G.
Rhea, Robert
Riley, William
Rugg, Maynard B.
Russell, John L., Jr.

Sanford, S. A.
Sargent, Don
Scheving, Albert
Schuch, William
Seawright, Byron
Shearman, Roger C.
Shipser, C.

Shorr, Lester
Slifer, Clarence
Smalley, Alfred E.
Smith, Dave
Smith, H. C.
Soderberg, Edward F.
Southcott, Fleet
Straumer, E. Charles
Strong, William M.

Terzo, Fred
Thomas, Jack
Tolmie, Rod
Tripp, Roy

Van Trees, James, Jr.
Van Wormer, John Pierce

Walsh, Mike
Ward, Lloyd
Weddell, Paul K.
Weiler, Carl
Weiler, John
Weisbarth, Ted
Weissman, Leonard
Weilman, Harold
Wendall, Jack E.
White, Edward L.
Whitley, William
Willis, Bert
Worth, Lothrop

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Allan, Ted
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Autrey, Max

Bachrach, Ernie
Bjerring, Frank
Blanc, Harry
Breau, Joseph F.
Bredell, Elwood
Brown, Milton
Bull, Clarence S.
Bullock, Chas. E.
Bullock, Malcolm

Clark, Sherman L.
Coburn, Robert
Cooper, John
Cronenweth, W. E.
Crosby, Warner N.
Crowley, Earl

Elliott, Mack
Ellis, John
English, Donald A.
Estep, Junius D.
Evans, Thomas
Evansmith, Henry

Farrell, David H.
Freulich, Roman
Fryer, Elmer

Gillum, Don
Gillum, Tad A.
Gold, Milton
Graves, Clarence "Stax"
Graybill, Durward
Grimes, William H.

Head, Gordon G.
Hendrickson, Fred S.
Hester, Jerome E.
Hewitt, Clarence B.
Hommell, Geo. P.
Hopcraft, N. John

Johnson, Roy L.
Jones, Raymond H.
Julian, Mac

Kahle, Alexander
Keyes, Donald B.
Kling, Clifton
Kornmann, Gene

Lacy, Madison S.
Leiber, Herman
Lippman, Irving
Lobben, C. Kenneth
Longet, Gaston
Longworth, Bert
Lynch, Bert

MacDonald, Melvin A.
MacLean, Roy D.
Manatt, S. C.
Marigold, Mickey
Martin, Shirley Vance
Maupin, Clifton
McAlpin, Hal A.
McNulty, Stephen
Miehle, John J.
Milligan, Joseph C.
Morrison, Talmage H.

Nolan, Raymond G.

Osborne, Harry
Parrish, Fred A.
Paul, M. B.
Powolny, Frank

Richardson, G. E.
Richee, Eugene R.
Robbins, Leroy S.
Rowley, Les

Schafer, Adolph L.
Schoenbaum, Emmett A.
Sibbald, Merritt J.
Sigurdson, Oliver
Six, Bert
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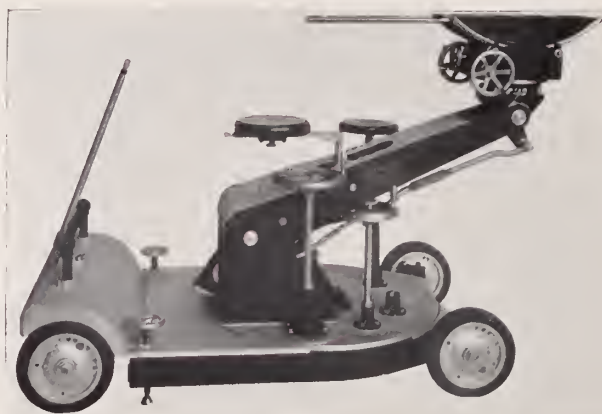
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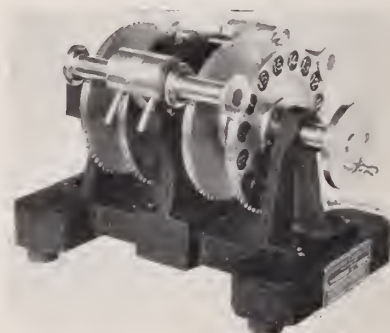
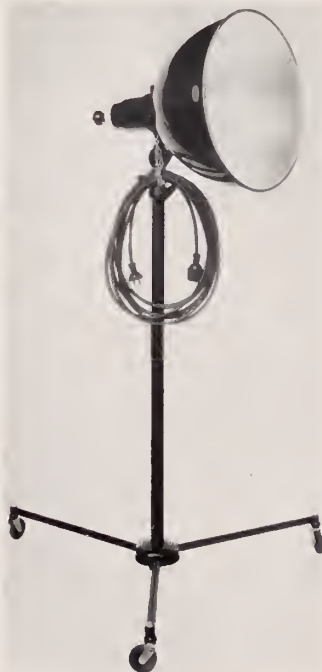
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Training Makes Triumphs— Is Charles Lang's Experience

by
Harry Burdick

WE have a new and second generation of ace cinematographers in this center of cinema circles. And a younger generation, in contradistinction to the old-line guard of camera wizards who have been performing photographic miracles since the very advent of sprocket-holed celluloid some twenty-five years ago.

As illustrious instance of this encouraging influence is nominated Charles Lang, A.S.C. In office as Director of Photography for the relatively narrow span of six years, from his camera have issued such outstanding cinematographic creations as "Lives Of A Bengal Lancer," "Peter Ibbetsan," "Desire" and, currently, "I Loved A Soldier," the latter duo being portrayals of Marlene Dietrich.

Here, certainly, is a recent succession of notable achievements worthy of the most matured artist. Each work is of merit compelling comment. His "A Farewell To Arms" brought to him the Academy of Motion Picture Arts and Sciences gold award in 1934. Annual appraisals by professionally discerning critics find his name high in reigning practitioners of the period.

Lang's meteoric ascent to cinematographic prominence is by no means a quirk of happenstance. Under it lies the same type of studious preparation and devoted acquirement of experience that marks the progress of ambitious members of medical, law and other professions. Following the forming of his university sheepskin, Lang got himself a job in the Paramount laboratory. It was just that and nothing more—a job. But it was, in reality, the launching of his life career, for during following years he was assigned to every department in that laboratory. Applying himself industriously and intelligently, he obtained by this laborious route complete understanding of what happens to negative and why.

Come long apprenticeships as Assistant and then Operative Cinematographer, learning stage technique and camera mechanics from the genius of established masters.

So, when opportunity presented him with complete control, it is not surprising that his broad and comprehensive steeping in fundamentals should show fruition in notable productions of exceeding worth.

He goes about his work calmly but with the fervor of the sharp specialist. He has the confidence inspired by his training, moves surely and swiftly. Scenes flow past his lenses with remarkable smoothness and speed, a phase not unappreciated by acting personnel nor keen-eyed production officials.

His two Dietrich sagas are superb specimens of prestige-star lighting. A definite controlled source of illumination is employed throughout. A high front-light paints glomorous



Charles Lang, A.S.C.

ous tones over the star's features. There is much shading and gauzing.

He lights individuals, not scenes; and then blends them into a scenic unity of balanced composition. The star is maintained as his photographic focal point but not to the detriment of other players nor the scene in its entirety.

This principle is observed irrespective of mood demanded by varying degrees of drama in story. The two Dietrich films are good instance. "I Loved a Soldier" has to do with a peasant chambermaid of the post-war period in Austria. It is in somewhat low key.

"Desire," dealing with an ultra-smart modern woman in sophisticated environment is for more brilliant and photographically scintillating. There is exposition of more contrast tonally. For every highlight there is an area of impenetrable black. The more intense the drama, the wider are these expanses of deep blacks.

But under both treatments, his shrewd sense of individual lighting prevails and with these italicized characters welded into harmonious scenic balance.

"Peter Ibbetsan" provided intricate problems of precise poise in mood determination. It required an obvious dream quality, yet that of a living dream; a feeling of reality in dream. There was much diffusion done at exact levels. Then, for the reminder of reality, Lang poured strong shafts of very real light in through opened windows and doors.

An absolute opposite is the "Bengal Lancer" undertaking. Here is definiteness of action, powerful flow of masculine movement. Lang evolved a strictly masculine mood with strong, robust and virile light. While he is blessed with an inherent drama sense, he appreciates the full audience appeal of bold strokes of sheer beauty, as this picture reveals. When the picture embarked on its commercial travels, box-office reports from all quarters acclaimed the appeal of this sweeping artistic ingredient. Some critics went so far as to assert this dominant beauty content actually carried the film.

Lang pursues his camera career unmonitored by "white elephants" of precedent or studio tradition. To his work he infuses the courage and enthusiasm of the artist who

Continued on page 105

Making Pictures in England

by
Lloyd Knechtel A.S.C.

SLIGHTLY over three years ago, in a Hollywood studio, I met a gentleman from the Humphries Laboratory of London. I must have been amused at the enthusiasm he showed in talking about the future of the British film industry, for I remember he left me with the remark, "Don't laugh—you'll probably be working with us in England yourself someday!" Less than six months later I was in England, associated with the Humphries Laboratories, and in charge of an Optical Printing and special process department which served most of the British studios! And during the three years which have elapsed since then, I have seen many of my friend's prophecies fulfilled, and even exceeded, by the phenomenal growth of the British Cinema.

To date things occurred, I arrived in England just as "The Private Life of Henry VIII" was in production; in fact, that film was one of the first British pictures on which I did any work. Up to that time, few even of the English had taken their film-industry seriously—and on wonder, for most of the activity in British studios had consisted of turning out "quota pictures" on budgets and schedules that would cramp the style of a poverty row quickie producer. Since "Henry VIII," of course, British pictures have improved until today you've got to look closely at the trade-mark to tell whether a film was made in Hollywood or England.

The foundation of this improvement was of course due to the fact that once Korda had proven it possible to make outstanding pictures in England, money became plentifully available for production. And a tremendous factor in the physical improvement of British films is that once the money was available, the British industry was eager to obtain the latest in equipment, and the most capable technicians.

The equipment used is predominantly American. An American row-stock—Eastman—seems to be the most popular film: strongly enough, in a country where so many excellent plates and photographic papers are produced, no English firm seems to have entered the motion picture film field, leaving it wholly to foreign interests; Eastman, DuPont and Agfa, with Eastman getting the lion's share of the business.

The camera equipment used depends very greatly upon the nationality of the Cinematographer using it. The Mitchell is fast becoming the most popular type for all classes of work; but the numerous German Cinematographers who have emigrated to England frequently use the French-made DeBrie "Super-Porto," which is a compact



Lloyd Knechtel, A.S.C.

outfit built into its own soundproof case. One studio for some time used a Czecho-Slovakian camera called the "Cinephon," but recently discarded them in favor of Mitchells. Some British-made Vinten cameras are also to be seen. The European-made cameras while beautiful examples of design and workmanship, do not seem to stand up as well under the hard usage of modern production as well as do the American Mitchells.

Lighting equipment, too, is mainly American, with the Mole-Richardson types the most popular. There are a few small British firms, but their products cannot compete with American lamps. There is nothing in Europe that can compare with the new Mole-Richardson "Solarspots".

George Teague's background projectors are being used in a number of the studios, and have that field pretty well to themselves.

A few years ago, the weakest point in the British film industry undoubtedly was the lack of good laboratories. I recall reading an article written in this magazine only a few years ago by a director who had made a number of pictures in England, which stated that there were only two good laboratories in all Europe—and neither of the two mentioned was in England. This situation has very definitely been remedied, and today the laboratories serving the British studios, and printing foreign releases for American producers are second to none. There are, I think, fewer studio-owned labs there than in Hollywood, and a greater tendency on the part of producers to patronize outside laboratories.

In sound, the familiar ERPI and RCA systems are evident, but several studios use British systems, especially British Acoustic and B-T-H, which are both excellent.

Most recently, England has grown intensely interested in color, and new or nearly-new color-processes are springing up overnight like so many weeds. As is well known, Technicolor is putting up a plant near London, and as Hollywood has already proved Technicolor's three-color process, the

Continued on page 102

Rapid

D-72		
Water (about 125° F.) (52° C.)	Avoirdupois	Metric
Elon	16 ounces	500.0 cc.
Sodium sulfite, desiccated	45 ounces	3.1 grams
Hydroquinone	1½ ounces	45.0 grams
Sodium carbonate, desiccated	175 grains	12.0 grams
Potassium bromide	2¼ ounces	67.5 grams
Water to make	27 grains	1.9 grams
	32 ounces	1.0 grams

CHROME ALUM FIXING BATH

(F-23)		
Solution A	Avoirdupois	Metric
Sodium thiosulfate (hypo)	2 pounds	960.0 grams
Sodium sulfite, desiccated	1 oz. 290 grains	50.0 grams
Water to make	96 ounces	3.0 liters
Solution B		
Water	20 ounces	600.0 cc.
Sodium sulfite, desiccated	290 grains	20.0 grams
Sulphuric acid, 5%	5 fluid ozs.	160.0 cc.
Potassium chrome alum	4¼ ounces	128.0 grams
Water to make	32 ounces	1.0 liter

Dissolve the constituents of Solution A and Solution B and cool bath to 70° F. (21° C.). Add Solution B slowly to Solution A while stirring the latter thoroughly.

CAUSTIC PROCESS DEVELOPER

(D-9)		
Stock Solution A	Avoirdupois	Metric
Water (about 125° F.) (52° C.)	16 ounces	500.0 cc.
Sodium bisulfite	¾ ounce	22.5 grams
Hydroquinone	¾ ounce	22.5 grams
Potassium bromide	¾ ounce	22.5 grams
Cold water to make	32 ounces	1.0 liter
Stock Solution B		
Cold water	32 ounces	1.0 liter
Sodium hydroxide	1¾ ounces	52.5 grams

For use up to 90° F., mix equal parts of A and B, and add 10 cc. of formalin (40%) and 10 cc. of Phenosafranine solution (1:1000) per liter of mixed developer (2½ drams per 32 ounces).

ULTRA RAPID DEVELOPERS

When the film can be processed by machine, and development times of 1 minute or less are desired, the D-82 developer, with 10 grams of extra sodium hydroxide added per liter (150 grains per 32 ounces), or the D-8 developer may be used. If the required development time is of the order of ½ minute, it may be desirable to add 25 cc. of ammonia to the modified D-82 developer.

D-82		
Elon	Avoirdupois	Metric
Sodium sulfite, desiccated	200 grains	14.0 grams
Hydroquinone	1¾ ounces	52.5 grams
Sodium hydroxide	200 grains	14.0 grams
Potassium bromide	125 grains	8.8 grams
Wood alcohol	1½ ounces	48.0 cc.
Water to make	32 ounces	1.0 liter

Other Rapid Developers

IN TABLES I AND II are also given the development characteristics of several rapid single bath developers for short times of development. The values listed are: gamma which is a measure of the degree of development; fog; relative emulsion speed, which is a comparative measure of the ability of the emulsion to render shadow detail; and highlight density, which is a rough indication of the density contrast obtained in a normally exposed negative of a subject of average contrast. It must be remembered that these are the values found under a given set of conditions as to quantity of developer, size of film, agitation during development, and so on, and that they will vary if any of these conditions are altered. However, although the absolute values will vary, the relations between the different developers will change very little if at all. It should also be noted that the indicated speed ratings are on a purely arbitrary basis, and are not directly related to the speed systems used with the various exposure calculators and exposure meters. The ratio factor necessary to convert these values to the system used with any given device can be determined from a test with some one developer, such as the SD-6 two bath, or the D-72.

The developers listed fall into two classes, those suitable for hand processing, and those which are only suitable for

ultra rapid development in special processing machines. These very rapid developers are not suitable for hand processing because the development times must be so short, in order to avoid excessive contrast, that there is not time to obtain uniform development over the whole surface of the film.

When the processing is done by hand, under the conditions mentioned previously, that is, where temperatures above normal may be encountered with no time available for cooling the solutions, the D-72 developer and the D-9 process developer with 1 per cent of formalin added, have been found very satisfactory.

In most cases, the D-72 developer is probably preferable, since it can be used for plates, films, and papers. Also it is more stable and oxidizes only slowly even when left standing in a tray.

This developer has a temperature coefficient of, roughly, 1.5 for a temperature change of 10°F. This means that to get approximately equal degrees of development at different temperatures, the development time must be divided by 1.5 for a 10 degree rise in temperature, and multiplied by 1.5 for a 10 degree drop in temperature. A time-temperature table is given on next page.

This developer has a sufficiently high concentration of salts to prevent excessive swelling up to 80°F., but it does not permanently harden the film so that an efficient hardening fixing bath must be used, and the film fixed long enough to allow of thorough hardening. The F-5 fixing bath may be used at normal temperatures but at the higher temperatures, the F-25 chrome alum hardening fixing bath should be used and the film treated for at least 3 minutes and preferably longer. With the chrome alum bath particularly, there is danger of scum forming on the bath from the neutralization of the fixing bath by the developer, so that the film should be rinsed for a few seconds in an acid bath such as the SB-1 after development, and then agitated thoroughly while it is in the fixing bath. Fresh fixing solutions should always be used for this work. The chrome alum fixing bath has the objection that it does not keep well, so it should be made up in small quantities which can be used in a few days.

In cases where temperatures higher than 80°F. must be used, the D-72 developer, even in combination with the chrome alum fixing bath, is not satisfactory. In such cases the D-9 caustic hydroquinone process developer may be used with the addition of 10 cc. of formalin (40% solution) per liter of the mixed developer to harden the film. Ten cc. of a 1 to 1000 solution of phenosafranine should also be added to prevent the formation of aerial fog which might be caused by the formalin. This developer, as the tables show, has a slightly higher rate of development than D-72, so the times given above or somewhat shorter times, may be used. This developer has poor keeping properties after it is mixed and should be used immediately. The F-5 fixing bath gives good results with this developer although an ultra rapid fixing bath can be used, as with the two bath developer. This developer gives good results at temperatures up to 90°F. but cannot be used satisfactorily at temperatures above 90°F.

It can be seen from the data given in the table that this addition of formalin to the D-9 developer causes a slight

Processing Methods

PART 2

by

H. Parker and J. I. Crabtree

Communication No. 577 from the
Kodak Research Laboratories

increase in the development fog, a slight decrease in the emulsion speed, and a very slight decrease in the rate of development.

More complete information on regular processing methods (not rapid processing) at high temperatures is given elsewhere.

Ultra Rapid Developers for Machine Processing

When it is possible to develop by machine as, for instance, with motion picture film, it is sometimes desirable to obtain high densities in very short times of development. With machine processing the treatment of the film can be controlled much more uniformly than is possible with hand processing, and it is quite satisfactory, therefore, to use very short times and very active developers.

A considerable number of developer formulas have been tested to determine their usefulness with very short development times and the data obtained for the most satisfactory formulas are given in the tables. These results show that when good contrast, with the greatest emulsion speed (ability to reproduce shadow detail) is desired in a very short time of development (1 minute or less), formula D-82 with the addition of 10 grams per liter of sodium hydroxide gives the most satisfactory results. This addition of extra sodium hydroxide to the D-82 developer causes a very considerable increase in the rate of development, so that considerably higher gammas are obtained. For the very short times of development, higher emulsion speeds are also obtained. It should be noted, however, that for the longer times of development, or for comparisons made at equal gammas, this advantage is lost, and the unmodified D-82 gives just as high emulsion speeds. For very short development times, around 30 seconds or less, it may be desirable to add 25 cc. of ammonia per liter to the modified D-82 developer. This addition is not satisfactory when development times of 1 minute or longer are used, because of the very rapid growth of fog, but for the very short times, it does help to obtain higher emulsion speeds. When the highest possible contrast is desired, the D-8 developer may prove more useful, but it should be noted that for a given exposure and equal times of development the D-8

	D-8	
	Avoirdupois	Metric
Sodium sulfite, desiccated	2 ounces	60 grams
Hydroquinone	1 ounce	30 grams
Sodium hydroxide	365 grains	25 grams
Potassium bromide	292 grains	20 grams
Water to make	32 ounces	1 liter

DEVELOPERS FOR UNDEREXPOSURES

When it is desired to obtain the utmost possible shadow detail from underexposed negatives, the D-82 developer for underexposures should be used, with a development time of about 8 minutes at 65°F.

ULTRA RAPID FIXATION

When rapid fixation is desired the hypo concentration of the fixing bath should be increased to 360 grams per liter (12 ounces per 32 ounces). If still more rapid fixation is desired, a non-hardening acid bath with added ammonium chloride may be used. Such a bath should only be used, however, with the two bath developer or with the D-9 developer containing formalin, both of which harden the film, and the use of an acid rinse bath between development and fixation is most important. The F-24 formula is very suitable for this purpose.

NON-HARDENING ACID FIXING BATH

(F-24)

	Avoirdupois	Metric
Water (about 125° F.) (52° C.)	16 ounces	500.0 cc.
Sodium thiosulfate (hypo)	8 ounces	240.0 grams
Sodium sulfite, desiccated	145 grains	10.0 grams
Sodium bisulfite	365 grains	25.0 grams
Water to make	32 ounces	1.0 liter

To make an ultra rapid fixing bath, the hypo concentration should be increased to 360 grams per liter (12 ounces per 32 ounces) and 25 grams of ammonium chloride added per liter of solution (365 grains per 32 ounces of solution).

does not give as high a density as the D-82 with the extra sodium hydroxide for, although it gives a higher gamma, it gives a much lower emulsion speed. When a high contrast is undesirable, but it is wished to obtain high emulsion speed without excessive density in the highlights, the D-82 and D-9 developers give better results than the two higher contrast developers.

While all of these developers give much more rapid development at higher temperatures, it is definitely unsafe to use them at high temperatures because of the danger of excessive swelling of the gelatin film.

Developers for Underexposures

The practical value of a developer for treating extreme under exposures is determined by the minimum exposure value which the developer is capable of differentiating from the development fog under the optimum conditions of development. Experience has shown that for Super-sensitive Panchromatic film treated in these high energy developers, the optimum rendering of shadow detail is obtained when the development is continued until the fog has a density of approximately 0.3 to 0.4. If the development is forced beyond this point, the fog begins to increase more rapidly, so that it tends to obscure some of the shadow detail. As can be seen from Table II, which gives the data for several developers, the gammas obtained at these optimum times of development range between 1.20 and 1.60. Under these conditions of development formulas D-9, D-82 and D-82 with added sodium hydroxide give practically equally sat-

Continued on page 106

Temperature

TIME OF DEVELOPMENT

65°F.	1 Min. 30 Sec.	2 Min.	2 Min. 30 Sec.	3 Min.	4 Min.
70°F.	1 Min. 15 Sec.	1 Min. 40 Sec.	2 Min. —	2 Min. 30 Sec.	3 Min. 15 Sec.
75°F.	1 Min. —	1 Min. 20 Sec.	1 Min. 40 Sec.	2 Min. —	2 Min. 40 Sec.
80°F.	— 50 Sec.	1 Min. 5 Sec.	1 Min. 20 Sec.	1 Min. 40 Sec.	2 Min. 10 Sec.
85°F.	— 40 Sec.	— 55 Sec.	1 Min. 5 Sec.	2 Min. 20 Sec.	1 Min. 45 Sec.
90°F.	— 33 Sec.	— 45 Sec.	— 55 Sec.	1 Min. 5 Sec.	1 Min. 25 Sec.

Problems of Controlling Correct

Photographic Reproduction

PART 4

IN DEALING with the subject of color sensitivity of photographic emulsions in relation to visual sensitivity, we have entered the most complex phase of our problem.

At present four types of photographic emulsions are in practical use which are distinguished by different color sensitivity. They are as follows:

(a) **Color Blind Emulsion.**

To this group belong emulsions which are only responsive to blue, violet and ultra-violet. They are represented in practice by Positive film and Sound Recording film.

(b) **Orthochromatic Emulsion.**

In addition to the original blue sensitivity, which is an attribute of all Silver Bromide emulsions, this type is sensitive to the yellow-green range of radiation. Its practical application in the 35mm motion picture field is rather limited at present as it is only used for reproduction of dupe negatives.

(c) **Panchromatic Emulsion.**

This type responds to practically all wave lengths within the visible range of radiation and extends its sensitivity even further towards red and naturally, also, into the ultra-violet range. It is the type generally used for picture negative production.

(d) **Infra Red Emulsion.**

This type, in addition to the original blue sensitivity of the Silver Bromide, is sensitized for the visible dark red and extends its sensitivity far into the invisible range of Infra Red radiation. It is used in scientific work such as astronomical photography, special effects, particularly artificial night scenes, aerial photography, cloud effects, and especially long distance shots where aerial haze prevents registration on other types of emulsions.

The spectral sensitivity curve of a photographic emulsion is commonly determined by means of a spectrophotograph. This instrument permits only relative judgment or comparison of color sensitivity, and the results obtained might be of very little practical value.

In practice, the color sensitivity is usually tested by actual reproduction of colored objects in conjunction with the use of light filters.

Referring to the discussion of the relation between color sensitivity of photographic emulsions and visual sensitivity, it might be well to first refresh the mind of the reader with some of the fundamentals and terminology of color.

1. Visibility Curve and Spectral Sensitivity Curve of Photographic Emulsions.

The visibility curve represents the relation between visual sensation and wave length. It is measured in brilliance units which are plotted for all wave lengths creating a visual sensation upon the retina of the eye. The shape and the maximum of this curve changes and shifts to a certain extent with any change of the brightness level or intensity at which the reading of the brilliance units are made. For an average brightness level of a non-selective light source

(white light), the maximum brilliance lies at 556 m/μ (yellow-green), decreasing rapidly towards longer and shorter wave lengths and becoming only 1% of the maximum value of 430 m/μ (violet) and 690 m/μ (dark red).

The spectral sensitivity curve of any photographic emulsion differs widely from the white light visibility curve, even when considering the best color corrected type, represented by Panchromatic film. The visibility curve resulting from certain selective light sources such as Mazda light, comes much closer in shape to that of the spectral sensitivity curve of the Panchromatic type, which is one of the reasons why corrective light filters are not in need when photographing indoor sets with Mazda light on Panchromatic film.

2. Visual Sensation.

The total visual sensation can be composed of three factors, brilliance, hue, and saturation.

- (a) Brilliance is that attribute of any color which makes it comparable to same member of the series of grays.
- (b) Hue is an attribute of certain colors by which they differ characteristically from a gray of the same brilliance, and which permits them to be classed as reddish, yellowish, greenish, or bluish, etc.
- (c) Saturation is that attribute of all colors possessing a hue which determines the degree of difference from a gray of the same brilliance.

According to these definitions,* two groups of colors have to be distinguished, one of which represents the non-selective or neutral type and includes all grays between black and white. These colors are hueless and differ from each other only by the brilliance factor.

The other group includes all selective colors, which in addition to being distinguishable by the brilliance factor, create a sensation of hue and saturation. Hue is the qualitative attribute, which distinguishes this color from a non-selective gray of equal brilliance, while saturation is the quantitative attribute expressing the magnitude of the difference between a selective color producing a sensation of hue and a hueless color.

* (See transactions of the Society of Motion Picture Engineers, Volume 10, No. 27, Page 135, and following pages.)



An artist's sketch of the placement of clouds in a scene. Clouds to be made synthetically.

Making Clouds To Order Pays

by
Wilton Scott

THE MONEY lost by motion picture troupes forced to "sit down and wait for clouds," if it could ever be totaled, would probably pay the National Debt. The artistic damage caused by attempts to carry on in spite of vacant skies doesn't appear on the cost-sheets, but it, too, would reach an appalling aggregate. And a stenographic report of the comments of all the Directors and Cinematographers who have had to do these things could never go through the mail.

Everybody, in fact, talks about the cloud situation—but nobody ever seems to do anything about it.

That is, until recently. Within the past few months, a world-famous artist and an equally famous Director of Photography, in the course of preparing to film one of M-G-M's most important productions, decided that something would have to be done to ensure the "casting" of properly pictorial clouds in the film. There they were in the illustrator's sketches of the scenes. Less visible, but no less important, they were an integral part of the Cinematographer's visualization of his compositions. Dan Sayre Grosbeck, the illustrator who created the craft of "visualizing" for the screen, and Karl Freund, A.S.C., their heads almost literally in the clouds, have evolved an idea which bids fair to solve the cinema's cloud question.

If nature doesn't supply your clouds, they reasoned, and practical or artistic considerations preclude the possibility of using a conventional matte-shot, the only thing left is to make your own clouds! And that is exactly what they propose to do: combining the Navy's smoke-screen with the Army's smoke-bomb and the sky-writer's trickery to reproduce any natural cloud-formation the weather-bureau could name, in any desired color or combination of colors, "spotted" at exactly the time and place called for by script and production-schedule!

"We were discussing the clouds I had in my sketches," Grosbeck relates, "hoping the weather-man would give us a break when the time came to shoot—though we knew precious well he wouldn't. After we'd expressed ourselves fairly fully, we began to talk about some of the clouds we'd

seen and been unable to sketch or photograph. That eventually led us to reminiscences of the fluffy clouds made by bursting shells and signal-bombs during the war—Karl, you know, had seen them from the German side of the lines, while I had admired them between my duties with the Royal British Field Artillery. That in turn reminded me of the time when, in the Siberian Expeditionary force, we used to use fluffy white smoke-bombs to try to entice the Bolshevik artillerists into firing a few rounds so we could spot their battery positions (we hadn't any observation-balloons or planes). I told how I used to sprawl on the hillside and watch their white smoke-puffs billow in the sky. How useful some of those shells would be to make movie clouds!

"We stared at each other—why not? Mortars and shells are still available, and there are plenty of ex-artillerymen to do the shooting! We began to check over the smoke-materials that were available, and how we could use them for cloud-making.

"The Navy's aerial smoke-screen chemicals can be combined to produce clouds that are clean white, yellow, or black. The artillery smoke-bombs come in both white and black. As far as color goes, then, we could duplicate any natural clouds. Next, how about duplicating cloud-formations—and getting them where we wanted them? As far as motion pictures are concerned, the most important cloud-types are the Cumulus and Stratus clouds—the big puffy billowy ones and the long, thin streaks.

"Making Cumulus clouds would be easy, big, low-lying ones, at least. Simply put white smoke-shells into mortars, time them to burst at the right place, and the billowy puff of smoke does the rest.

"For the Stratus clouds, a sky-writing airplane will be

Continued on page 102

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Making Clouds to Order Pays

Continued from page 101

used. Its trail of smoke will make an excellent Stratus cloud. Another 'plane must be used to provide high Cumulus clouds if such are needed. For this, we went back to an almost-forgotten trick in air bombing. In the early days of the war, airplane bombing wasn't at all accurate, so we used to fly low, trailing a bomb from a long rope, and explode it electrically when it reached the right place. A plane, flying high, and trailing a white smoke-bomb from a long cable can produce our high-altitude Cumulus clouds.

"Now, in practice, here is about how the idea works out. Let's say we have a village set here" (starting to sketch the illustration reproduced on this page): "behind it rises a hill. Now, we want some big, white Cumulus clouds billowing over the hill. Lower down, near the horizon, we want a darker layer of low-hanging Stratus clouds. Above, at the top of the frame, we may want a few puffy little Cumulus clouds.

"Behind the hill, we station our cloud-guns. Above, our sky-writing and bombing ships are waiting. When all is ready for the scene, a signal goes to the gunners who, working to an accurately-ranged plan, fire their smoke-shells up into the air, to burst slightly above the level of the hilltop. At a signal—wig-wagged or radioed—the sky-writing plane streaks through, trailing his smoke-screen of black or yellow smoke. Above, the other plane, guided by signals from the ground, explodes its trailing smoke-pots in the proper places. Then the pilot of that ship turns nose-upward, and streaks out of camera-range. Everything is ready for the scene: the cameras start, and the scene is made."

Cinematographer Freund agrees that the idea is a step forward. "Well," he says, "something has to be done about clouds—and this seems to fill the bill under many conditions. There are some scenes to which you can add clouds by glass-shots, double-printing, and such methods, but in others, the action or other considerations may prevent the use of a matte. There is where this cloud-making method will be useful.

"Of course weather-conditions will still hamper us to some extent: a high wind will ruin our clouds even quicker than natural ones—but we don't often shoot on such days anyway. Under ordinary conditions, we should be able to keep our

synthetic clouds in place long enough to shoot the average scene. Some types of smoke will stay in place for ten minutes (longer on a still day), while others will remain for half-an-hour or more.

"The whole thing is essentially a matter of timing. Everything must be done at the right time, or our cloud-potterns won't fit. We must wait until the shell-burst clouds stop their first speedy billowing, and start shooting before the thinner types blow away. But that can be worked out.

"There will certainly be a definite advantage in being able to plan the clouds as a part of your composition, and fit them to your lighting! We are not so optimistic as to claim that the plan is the ultimate solution to the problem, but it is at least a step in the right direction."

Making Pictures in England

Continued from page 97

Technicolorists seem to have the inside track in British color. Our plant has been handling Bipack color, using Dunning's methods, with excellent results. One of my most interesting experiences came when we were testing the process, and I had the privilege of filming some of the parades held in connection with King George's Jubilee last summer. It was a magnificent spectacle, and with the reds and blues predominating in the flags and uniforms, made a striking color subject.

I have heard some comments on the sets used in "Henry VIII," some of which seemed crude to American eyes. In that production, it must be remembered, Korda was trying to turn out a Class A feature for a budget that would have been small for a program release, so he had to cut corners in many departments. The general run of sets now used are, I think, in almost every way equal to those used in Hollywood. One thing, however, the British have not as yet learned: that is the practice followed in many studios here, of painting in the larger shadow-masses on the set, so as to simplify lighting.

On the other hand, some of the British studios have an idea that could be copied to excellent advantage in America. This is the use of standardized metal set-platforming. They use standard tubular

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metol units, fitted together with bolt-fastened clamps, and floored with standardized wooden catwalks. It is unbelievable how quickly a crew can platform a set with this system. There is no sawing or fitting to be done; no nailing. The metol tubes are simply clamped into place—and that's that: the platform is ready to use. It is easy with this system to get the lamproil at exactly the right height for low sets, or to conform to oddly-shaped ones. The same units can be used to make parallels and all sorts of special equipment: they have even built a workable crane out of the tubes when the script called for a boom shot.

The British have one peculiar custom which makes it hard for the laboratories and technical personnel. This is the "Trade Showing." They don't preview their films as we do here, but as soon as the film is completed, they have a Trade Showing in some large theatre, to which the press, exhibitors, and so on are invited. The picture may not be released for six months—but the special-effects stuff, the cutters, scorers, re-recorders and especially the laboratory people have to work like mad from the time the last scene is shot until the Trade-Shaw print is ready.

When I went to England, I found that the laboratory had only the smallest nucleus of a special-effects department, and my task was only a little ahead of starting from scratch. That we are today handling every kind of special-effects work—optical printing, miniatures, matte-shots, and Dunning and projected-background composites—for most of the British studios and for many of the American ones, speaks well for the ability and cooperation of my British co-workers. And all of them are British except myself and Bill Leeds, who came over with me to see to the building and maintenance of our equipment. At the time we arrived, optical printing was almost unknown in Europe, and you can imagine the difficulties experienced by directors and writers who had only direct cuts at their disposal to use as transitions. Today, several excellent optical printer installations, operated either by Americans or by Britishers trained by Americans, furnish almost every optical transition known, though Elstree did not follow Hollywood's example in exaggerating the use of trick optical transitions.

At present, the foreign Cinematographers are pre-eminent in England, though there are a number of excellent English cameramen. In addition to such familiar American Directors of Photog-

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raphy as Hal Rissan, A.S.C., Lee Garmes, John W. Boyle, A.S.C., Glenn MacWilliams, A.S.C., Phil Tannura, and the rest of the American contingent, there are quite a number of Germans who for one reason or another have left their homeland during the last few years. In connection with cameramen, the British have a custom which, I think, Hollywood might well copy: they give screen-credit to the Operative Cameraman as well as to the Director of Photography. On their credit-titles, you will see, "Photography by A. Sa-and-Sa, Camera, J. Whatzisname." The man credited for "Camera" is the Operative.

I have frequently been asked about the advisability of going to England to work. In my own case and that of others, it has been a good move. In other instances, the results have not been so happy. The British pay well for technical talent, and though taxes and living costs are high, England is a very pleasant place in which to work and to live. But let me strongly advise my Hollywood friends not to come to England on speculation: the government regulations are very strict on this point, and the man who comes other than to fill a

definite position has in addition to the problem of finding a job, the certainty that the authorities would not permit him, as a visitor, to take one even if he found one.

Training Makes Triumphs

Continued from page 96

realizes that greatest creative achievements always lie just beyond in the future.

There is encouraging and hopeful indication for the healthy artistic forward days of the cinematographic profession that artist-technicians as exemplified by Charles Lang are being attracted to the fold and are forging to far-flight ranking.

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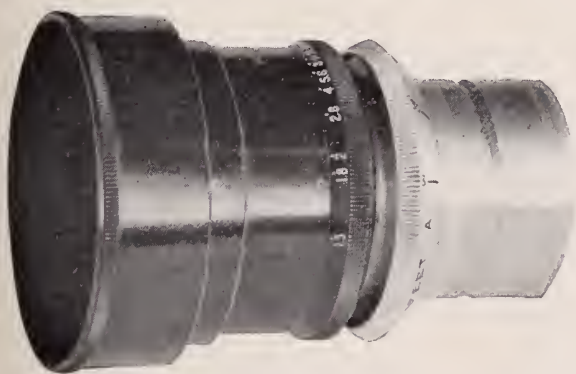
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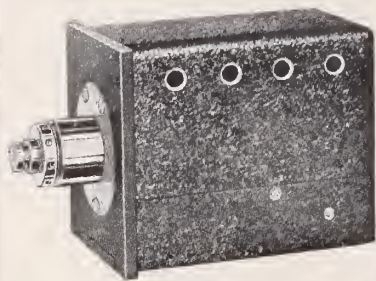
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parted a decade or more back—when a man could merely drift into a camera career. Cinematography as currently performed is a craft that can not be mas-

tered from text-book perusal. There is no substitute for the long, intense apprenticeship period of gaining active experience.

Problems of Controlling Correct Photographic Reproduction

Continued from page 100

4. Absorption, Reflection and Transmission.

Any natural object is visible by virtue of the incident radiation which it transmits or reflects. Any object that transmits or reflects all wave lengths of visible radiation in equal proportion belongs to the group of neutral or non-selectively colored objects, such as gray, white or black, depending solely upon the extent to which they reflect the incident radiation.

All objects which absorb certain wave lengths of the incident radiation to a greater extent than others are selective absorbers. Radiation, which is reflected or transmitted by such objects is different in spectral composition from that which was incident thereon.

The color which an object appears to have depends, therefore, on two factors, its absorbing characteristics and the spectral composition of the incident radiation.

Most of the natural colored objects are of the reflecting type with selective absorption. Consequently, the vast variety of pigments and dyes and their spectral absorption curves are of vital importance to the photographer.

Objects of the transmitting type with selective absorption are best known to the photographer in the form of color filters which are used to selectively absorb or emphasize certain portions of the radiation reflected by the object being photographed.

The absorption curves of pigments are in general characterized by a more or less gradual cut off in comparison to those of transmitting objects, such as color filters, which must show a relatively sharp cut off.

5. Luminosity Curve and Photicity Curve.

The ordinates of the visibility curve as previously explained consist of brilliance units. When multiplying these ordinates with those of the spectral reflection curve for any given selective absorber (such as a pigment for instance), and plotting this product against wave length, the luminosity curve is obtained. The area inclosed by this curve indicates the relative brightness of this object for a given light source.

Similarly when multiplying the ordinates of the spectral sensitivity curve for a photographic emulsion with the ordinates of the spectral reflection curve of any object and plotting this product against wave length, we obtain a curve which is known as the photicity curve.

The area of this curve is proportional to the photographic brightness of the object considered.

These few fundamentals of color should be studied and understood by anyone who concerns himself with the problem of correct photographic reproduction.

The solution of this problem, as was previously stated, consists of rendering brightness and brightness differences or contrast in the final print identical to that conceived by the eye from the natural object.

In practice it will be found that an additional problem of equal importance exists which requires deliberate distortion or a deviation from correct reproduction in order to secure certain desired effects.

Both problems will be discussed further in the following issue.

Rapid Processing Methods

Continued from page 99

isfactory rendering of detail in the extreme shadows, while D-72 gives somewhat less detail in the shadows, and D-8 still less. This is illustrated graphically in Figure 1 which shows the relative appearance of negatives which had been given graded exposures and then developed for the optimum times as shown in

Table II. It can be seen that the strips developed in D-82, D-82 with added caustic, and D-9 show from one to two more steps in the extreme shadows than the strips developed in D-8 and D-72. Since each step corresponds to a decrease of approximately 20 per cent in the exposures, this indicates an increase of 25

to 40 per cent in the effective emulsion speed, which is approximately the increase shown in the table.

Rapid Fixing

The rate of fixation as measured by the time required to clear the film of undeveloped silver salts, depends on a number of factors, the most important of which are: hypo concentration, degree of exhaustion of the bath, temperature, and degree of agitation. For low concentrations of hypo the clearing time is decreased as the concentration is increased, reaching a minimum value for Eastman Super-sensitive Panchromatic film at a concentration of about 360 grams per liter of hypo. If the hypo concentration is raised above this value, the clearing time again increases. For rapid work, therefore, extra hypo should be added to the usual fixing bath formula to bring the total hypo concentration to 360 grams per liter (3 pounds per gallon).

When a fixing bath is used, a number of changes occur which tend to increase the clearing time. Therefore, fresh fixing solution should always be used. The temperature of the bath has a considerable effect, higher temperatures giving more rapid fixing but, on prolonged storage at high temperatures, the bath is apt to sulfurize. The F-5 fixing bath can be used up to 75°F., while for processing at much above this temperature, the F-23 chrome alum hardening fixing bath should be used. Thorough agitation of the film in the fixing bath decreases the clearing time considerably as it helps to wash away the dissolved silver salts and supply fresh hypo to the emulsion. Since agitation also helps to prevent the formation of a scum on the emulsion surface, it should not be neglected.

If a still shorter fixing time is desired, an improvement can be obtained by the addition of about 25 grams per liter (3¼ ozs. per gallon) of ammonium chloride. If much more than this quantity is added, the clearing time will be increased, but this quantity gives a decrease, particularly if the hypo concentration happens to be a little low. The addition of ammonium chloride seems to be most effective with a non-hardening bath such as the F-24 with increased hypo but it also has some effect with hardening baths such as the F-5.

For rapid processing, fixation may be considered to be sufficiently complete as soon as the milky appearance has disappeared from the emulsion. The processing is completed by washing the film for 2 minutes in a rapid stream of water and drying with blasts of warm air directed against both sides of the film. The warm air blasts may be most conveniently obtained with small electric

hair dryers. To hasten the drying and prevent the formation of water marks on the film, all drops of surface water should be removed by wiping both sides of the film with a piece of absorbent cotton, chamois leather, or viscose sponge which has been thoroughly wetted and then squeezed as dry as possible by hand.

After the prints have been made, the negative should be returned to the fixing both for 5 or 10 minutes, then washed thoroughly and dried in the usual manner, otherwise there will be danger of fading of the image if the negatives are to be kept for any length of time.

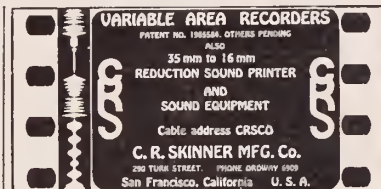
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Leica Inventor Passes

Oscar Barnack, inventor and designer of the Leica camera, died on Jan. 16th at Wetzlar, Germany, after being sick several months.

Barnack's invention did much toward popularizing photography among many who otherwise would not have taken up this hobby. The use of mo-

tion picture film made this type of photography very popular. The Leica camera was first intended for use in making tests in the studio, but its popularity as a candid camera soon outstripped its original function.

Harry Zech Returns

After spending five months in Great Britain, Harry Zech, A.S.C., has returned to Hollywood.

Zech went to London to do backgrounds and process work for Korda's London Films. Also while there he directed the photography on several independent pictures.

Bayle Now "Sunkist"

Jahn Bayle, A.S.C., who has been in London for these many months, became so sick for California sunshine or something as near to it as he could get, that he took several weeks' leave of absence. He flew out of London on New Year's day; then by rail through Italy, as the Italians will not permit British planes to fly over that country. Back to a plane at Brindisi, Italy, to Athens, Greece; then another plane across the Mediterranean to Alexandria and thence to Cairo, where he claims he found the proper sunshine.

According to his letter he used his Leica freely in Egypt, but was not allowed to use it in Italy while flying.

Bayle met Ariel Varges in Cairo, he having just returned from Abyssinia. Harry Perry was in London.




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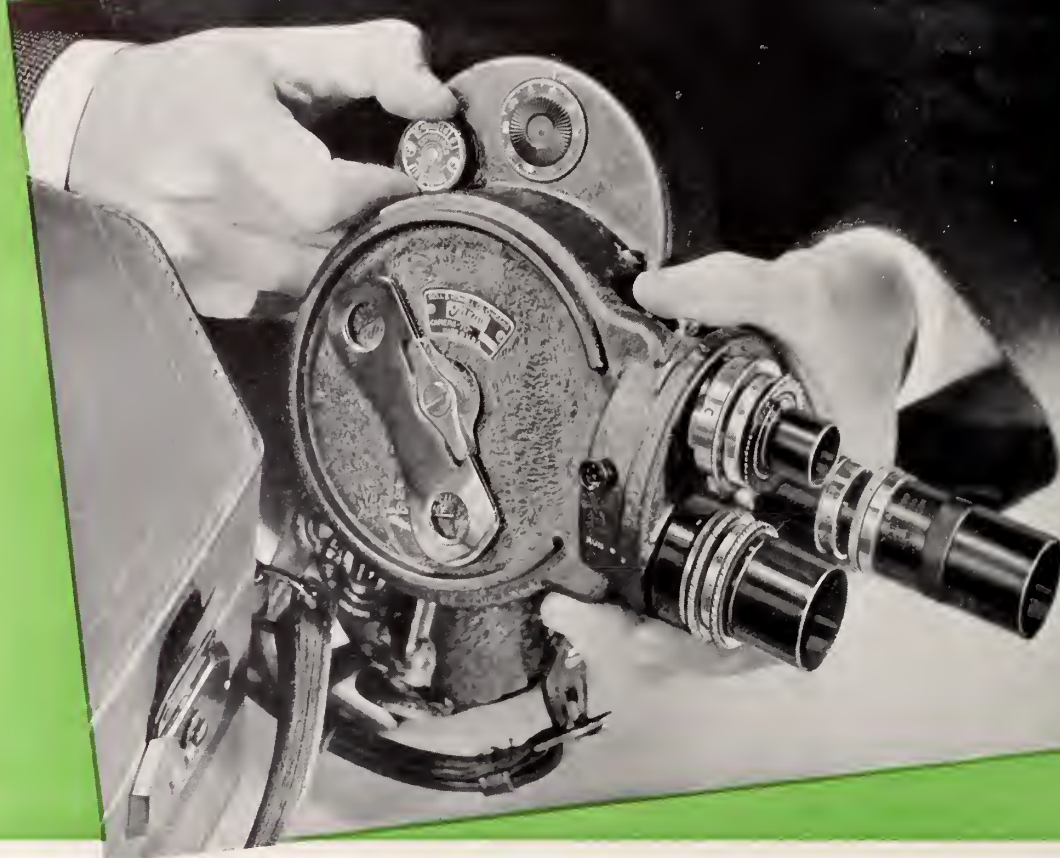
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AMATEUR MOVIES

t his issue

Shooting An 8mm Prize Winner
Balancing Sea and Sky
When to Use Double Exposure
Optical Tricks You Can Do
Projection Cabinet . . home made
. . . and other features

MARCH,
1936

25c

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AMATEUR MOVIE SECTION

Contents . . .

Balancing Sea and Sky with Filters by Arthur Edeson, A.S.C.....	114
Shooting an 8mm Prize Winner by Dr. F. R. Loscher.....	115
The Camera Goes "Raund and Raund" by Barry Staley.....	116
Montage and Symbolism Are Entirely Different by Max Liszt.....	117
When to Use Double-Exposure by Walter Blanchard.....	118
Optical Tricks You Can Do by Jerame H. Ash, A.S.C.....	119
A Handy Gadget.....	120
Here's How by A.S.C. Members.....	121
Films I Have Used by Elmer G. Dyer, A.S.C.....	122
Wheels of Industry.....	124

PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the **AMERICAN CINEMATOGRAPHER**. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

Next Month . . .

Next month's amateur section will again be rich in information right from Hollywood headquarters. A.S.C. members and outstanding Amateur Cinematographers will contribute articles.



Balancing Sea and Sky With Filters

by
Arthur Edeson, A.S.C.

QUICK adaptability is the keynote of success in filming seascapes. You can't bind yourself to one hard-and-fast rule of technique, for the combination of filters, lighting and exposure which gives you a perfect shot today, may not work at all under the conditions you'll meet trying to duplicate the shot tomorrow. Besides, in different scenes, you will have different things to show, and have to present them differently.

Essentially, photographing water scenes is a problem in contrast. You have three basic factors in your picture: sea, sky, and your subject, be it a boat or people. The problem is to reproduce them in black and white on the screen in such a way that folks won't have to stop and figure out which is which. A combination of filtering and lighting is the answer: but the exact combination is subject to infinite variation, because the components of your picture are themselves subject to such variation. The water, for instance, can vary from a strong, clear blue through a range of greeny-greys to a dull slate grey. It may reflect relatively little light, an overpowering glare, or (which is worst) a myriad of dancing catch-lights. The sky, too, can range from a clear blue through a baffling range of haze to cloudy grey and a sultry grey-white. It may be "bald-headed" (cloudless), or sprinkled with thin or thick clouds, or entirely overshadowed. Your subject—well, what variations can't it undergo? You may have a long-shot of a white-sailed windjammer or yacht, a dark liner or battleship, a spray-clouded speedboat, or close-ups of people on

boats or looking at them. Your technical treatment must be as changeable as a politician to meet all these variations.

We'll start out by assuming that your exposure is going to be correct. With all the accurate exposure-meters now on the market, there's no excuse for anything else. Besides, in marine camerawork, there is so little latitude between correct exposure and overexposure in the brilliant sea and sky, on the one hand, and underexposure in the shaded areas, on the other hand, that exposure has to be abnormally accurate.

Generally speaking, the aim of filtering should be to provide merely a mild correction, and to cut down the excessive glare. Only on rare occasions is it good to use heavy filters, for they darken the water until it looks definitely unnatural. My personal preference is for the 3-N-5 and the 5-N-5, which consist respectively of an Aera 1 filter combined with a .50 neutral density, and an Aera 2 in the same combination. The Aera filter provides for enough mild correction to make the scene reproduce naturally, while the neutral density screen which is added controls the glare. I used these filters very extensively in making "Mutiny on the Bounty." Sometimes, when the sky and sea are a vague "washed out" blue, you may find it wise to use a heavier filter, in order to separate the two. On the other hand, there are hot, hazy days when both sea and sky show little, if any color, and throw back a sultry, white-hot reflection: then a color-filter is often of little use, and a heavy neutral density filter is the thing, for controlling the glare is all anyone can hope to do.

Only when the sky is clouded over, and both sky and sea are a leaden grey is it safe to use the contrast filters (G, 23-A, etc.). These filters always increase contrast, and if filming a clouded seascape, they may at times help to make a subject such as a ship stand out a trifle more clearly against its grey background. But they should be used sparingly!

When there are picturesque clouds in the sky, and your camera is set up on a good, solid foundation such as dry land, you might try a graduated filter to make the clouds stand out more strongly, without overcorrecting the water. This is rather tricky, though, as the upper division of the graduate must be rather heavy to produce the desired result and it is essential (and by no means easy) to get the dividing-line of the filter at a point in the picture where it won't show up unpleasantly. Using such a filter when you are on a boat is, of course, impossible, for as the boat rolls, the dividing-line of the filter—and the change in filter-correction—dances all over the screen.

There is one type of shot where all normal standards of balance and color-rendition can be thrown overboard. This is when you are filming a speedboat in action. The most picturesque thing about a racing motorboat, whether it is a "Miss America" or a tiny outboard-motor racer, is the visual contrast between the water and the mountainous, snowy wake of the boat. Photographically, this calls for heavy filtering, to increase the contrast. A red filter, such as the 23-A, the 25-A or even the 29-F, is the thing. Such a filter overcorrects the water—the heavier ones will make the water photograph almost jet-black—and provides a background against which the wake's white spray stands out impressively.

Lighting is doubly important in marine photography—and all too often almost beyond control. Generally speaking, when you are photographing a ship or boat, you can't control its course; you have to set up your camera and get the best shot possible under the circumstances. Even in "Mutiny on the Bounty" we couldn't shape the maneuvers of the "Bounty" and the "Pandora" wholly for the camera.

Continued on page 131



Shooting An 8mm Prize Winner

by
Dr. F. R. Loscher*

TO almost every amateur, at some time, comes the desire to make a real production, and that desire reached a climax one night as I read Wallace D. Coburn's book entitled, "Rhymes From a Roundup Camp." A poem from that book called "Ta An Indian Skull," seemed to have all that could be wanted for such a picture. In my mind I could see the wagon wheels in the dust, and the dreaded Indian attacks, but to dream of them, and to produce them on the 8mm strip were two different things.

The properties available were only three horses, two mules and one wagon. From the river bed we secured willow sticks which shaped very nicely for the bows of the wagon cover. The cover was made from a piece of old canvas which had been used as a tractor cover. Old leather coats, hats and burlap sacks made most of the costumes. The two dresses used had to be switched between our four female characters. The Indian costumes and old flintlock guns were loaned from the collection of Mr. Coburn, a personal friend of mine.

The hardest part of the shooting was to cover up undesirable backgrounds. The angles had to be up or down, and when shooting from under the wagon in the battle scenes the horses' feet raised enough dust to make a screen which blocked out fences and fruit trees.

One of our jobs was to rig up a set to represent the back

end of the wagon, with water keg and sacks. In the opening of the battle scenes the keg was pierced by an arrow and showed the water trickling out. This was done by making a hole in the keg and adjusting a small piece of hose next to the arrowhead. This hose siphoned the water from a can above, giving the effect of leaking. The arrow was then held back and allowed to spring forward as the camera went into action. This springing motion cut carefully with the preceding scene gave the effect of an actual hit.

Toward the end of the story, the wagon train leader is shot while trying to secure more water. This called for fast cutting from a dummy being hit to the leader falling forward with an arrow in his back. The wagon train was pictured by showing only one full shot of the wagon in a series of close shots of the mules' feet and wheels rolling along in the dust.

The cutting of this picture was of great importance; many scenes which looked beautiful and which I would like to have saved were cut short to improve the tempo of the picture. Many of the scenes were only two or three inches long and without quick action a drag would have developed. The tempo of the picture was also raised by the use of double and triple exposures, one especially a close-up shot of horses' feet galloping by was carried through a full wind of the camera. This was then cranked back and the image of a pioneer with rifle was lap dissolved with a burning wagon and two girls and a child running by.

Now for a word about the camera and accessories used. The Eastman Model 60 8mm was used. It had been equipped with a wind-back by the Fried Camera Company, which allowed for producing special effects very easily. The Harrison sunshade and fading glass were also used in the lap dissolves. Fades in the picture were produced by the dye method, using a product manufactured by the Dye Research Laboratory of Los Angeles, called Fotofade. This enabled me to put in many fades which had not been calculated at the time of the shooting. Many of our shots were taken almost directly into the sun to secure effects and back lighting, and at times the sun-shade did not give enough protection to the lens, so it was necessary to use same larger shade above the camera.

The reflectors used in the shooting were made of wall-board with tinfoil glued to them, and a wooden frame-work

Continued on page 124



*Winner of the Grand Prize in the American Cinematographer 1935 Amateur Movie Contest.

The Camera Goes 'Round and 'Round

by
Barry Staley

HERE is a continuity that is decidedly different. It takes you away from accustomed fields of motion picture making for an interesting excursion into realms of endeavor closely approximating those of the professional cinematographer.

It will provide plenty of fun in the shooting and screening, and give you opportunity for your creative genius to have full play.

Camera angles provide one means, and a most simple one, for injecting variety and life to your scenes. For some reason, the average amateur shies away from them. So here's a chance to dive in and see what effective results you can get.

Every community has a children's playground equipped with swings, teeter-boards, a miniature merry-go-round and similar devices for healthy outdoor sport. To this location we go for a little advanced lens activity.

MAIN TITLE: THE CAMERA GOES 'ROUND AND 'ROUND.

SCENE 1: MEDIUM SHOT of your car arriving at the playground. It stops and the family's assortment of children pile out, running eagerly toward the swings.

SCENE 2: LONG SHOT of the playground showing the various devices. The children run in.

SCENE 3: MEDIUM SHOT of a swing. The children run in happily and scramble for the first chance. Junior wriggles up into the seat.

SCENE 4: CLOSE SHOT of Junior in the swing. He moves forward and out of the camera as Sister, pushing from behind, comes into view.

SCENE 5: CLOSE SHOT, from a low set-up shooting up and parallel with the swing's line of flight; your focus is on Junior at the bottom of the swing. Junior, swinging back from his first upward push. He suddenly comes into view, his face in full focus and disappears as he swings away.

SCENE 6: CLOSE SHOT from a reasonably low set-up; your focus is on Junior at the top of his backward swing. He swings back and is clearly seen during that instant before the swing comes forward.

SCENE 7: MEDIUM SHOT. Borrow a high step-ladder from one of the park attendants. From this high angle PAN to follow Junior's sweeping swing forward.

SCENE 8: CLOSE SHOT. Put the ladder directly in front of the swing. Camera is focused on Junior's position at the top of his forward arc. Suddenly he swings up and into sharp focus, fading hazily as he swings back.

SCENE 9: CLOSE SHOT. The same set-up as Scene 8.



Change your shutter speed to 64 frames per second. When screened, Junior will languidly float through the air (with the greatest of ease), mysteriously hang suspended before your camera and lazily drift back.

SCENE 10: MEDIUM SHOT from the ground directly under Junior's highest forward point. Shoot up at him and PAN to follow the complete arc of his backward swing.

SCENE 11: MEDIUM SHOT, to be cut into Scene 11. Get in the swing yourself. Get your elbows locked around the ropes, leaving your hands free, camera leveled straight ahead. Get a husky shove from the youngsters and swing as high as you can. From the top of your backward swing, start the camera. Let it run through a full swing forward and backward. You'll get the ground, horizon and sky just as it looks to a swinger. When screened, you are taking your audience for a ride in that swing.

SCENE 12: MEDIUM SHOT. At the slide. Catch the children running in to the slide, climbing up the ladder and one after the other sliding down to the sand pit at the bottom.

SCENE 13: CLOSE SHOT. From the side of the slide, shooting up. One by one the children flash into view and disappear down the slide.

SCENE 14: MEDIUM SHOT from top of slide shooting down, following Junior's speedy descent and deposit in the sand pile.

SCENE 15: MEDIUM SHOT to be cut into Scene 14. Get in the slide yourself, camera shooting straight down the slide. Keep it turning as you slide down the chute. And don't stop it when you hit the sand pile, even though you turn over. The effect on the screen will be startling.

SCENE 16: CLOSE SHOT from the bottom of the slide, shooting up its length. Junior comes sliding down and directly into the camera. You can get the effect of his coming right off of the screen and into your lap.

SCENE 17: MEDIUM SHOT of the teeter board or see-saw. The children come running in and climb on, teetering merrily.

Continued on page 132

Montage and Symbolism Are Entirely

Different

by
Max Liszi*

SINCE the publication of my article on "Montage" in the January, 1936, issue, I have been requested by several to go more into detail regarding the application of "Montage" and cite other examples.

In trying to do this in the following article, I must bring in "Symbolism." "Montage" and "Symbolism" are two entirely different and separate subjects, even though at times they touch each other and seem to impersonate one another.

In "Symbolism" we symbolize a certain situation or person by the use of an entirely different object; but in "montage" we depend upon the composition of meaningless strips of films to bring over a "suggested" idea. At times these two will touch and, may be, overlap so that a dividing line is hard to draw.

Such a situation appears in Charlie Chaplin's picture, "Modern Times," and well in the opening sequence of this picture. Here we have a shot of sheep, immediately followed by a shot of many people walking. This could be, at first glance, called "Symbolism"; but by further analyzing we also get "Montage" inasmuch as we could tear these two strips of film apart and project them separately where-by each one would be meaningless as to "suggested" idea, but when connected and projected in composition they convey to the audience the "suggested" idea that the people in shot number 2 were "meek as a lamb" and therefore is "Montage," because the definition of "Montage" tells us that:

"'Montage' is a composition of strips of film, which in their combination and arrangement to one another convey to the audience a (suggested) idea or emotion; but lack this ability when torn apart and projected separately."

Immediately we see where this particular situation has an overlapping of "Symbolism" and "Montage" and the dividing line is hard to draw.

The "Montage" idea of "meek as a lamb" becomes more and more apparent to the audience as the film unfolds, and is brought home most forcibly to the spectator at the moment that the factory worker (Charlie Chaplin) rebels against the existing system while the others remain "meek."

To cite an example of "Montage" in its purest form I like to draw on one of my pictures. In this particular instance the situation was as follows: An old and shabbily dressed man is seen sitting on a bench, smoking a cigarette which he had picked up from the street. At this moment in the story it was advisable and necessary to tell something of the man's past so as to clarify more significantly developments in the man's behavior later on in the picture. Only a few feet could be used so as not to halt the flow of the present-story development; but in these few feet the idea had to be brought over that the man had been well off but had lost everything.

By applying "Montage" this was done as follows:

- (1) Close-up of man on bench.
- (2) Long-shot of a hotel.
- (3) Long-shot of the "Bank of America."
- (4) Long-shot of a neon sign reading, "security."
- (5) Close-up of a sewer.
- (6) Shot of man on bench.

In this particular story it had been previously established that the man was an old actor and therefore a hotel ("home"

to an actor) was chosen in number 2. Number 3 is syno-nymic for money; 4 and 5 speak for themselves. Each and every one of these shots do not mean a thing and most certainly do not convey any "suggested" idea or emotion when projected separately. But by grouping them in the manner as outlined above, preceded and closed by a shot of the man on the bench the "suggested" idea that the man had been well off once was conveyed to the audience in a few feet.

In "Montage" it is of the utmost necessity that the idea or emotion that is brought over to the audience is a "suggested" one. If it is not suggested the combination of the strips of film is not "Montage." By this is meant that the idea must not be received from any one of the strips of films in itself.

For example: Shot of a winding road, followed by a shot of a man sitting on the grass, his shoes off and rubbing his feet. This is not "Montage" inasmuch as we get the idea that the man has walked a far distance (come a far distance) by the very fact that he is seen with his shoes off and rubbing his feet, because if we omit the shot of the road and project the second shot separately we still get the idea that he has walked a long time, and therefore this is not "Montage."

"Montage" would be the following: Shot of a winding road, followed by a shot of a man smoking a cigarette, because neither one of the shots in themselves shows that the man had come a long ways; and by reversing these shots, first the man and then the road, we are able to reverse the "suggested" idea of the man having come a long ways to the "suggested" idea of the man having to go a long ways.

This example brings us up to the all important fact that in "Montage" the succession and placing of the various meaningless shots is of the utmost importance and requires careful consideration as a misplacing of any one shot either will destroy the "Montage" idea entirely or convey an entirely different "Montage" idea than what is demanded.

The reason that "Montage" is so little understood in Hollywood can be blamed on the abundance of money that is a Hollywood's disposal. On account of this abundance of money the directors of Hollywood pictures are depending on sets and the actions of the actors in the scene to bring over the idea, and have never had to rely on their own ingenuity and ability of story-telling with the camera.

If Hollywood did not have this abundance of money, its directors would develop and understand "Montage" inasmuch as "Montage" is an inexpensive but highly effective and powerful method in bringing a point in the story home to the audience.

This is one case where abundance of money is a drawback to the development of motion pictures as a medium of entertainment and education.

*Guest-instructor in "direction and story-construction" at the "New Film Group."



A simple double exposure. Above, first exposure of ship. Below, second exposure—a shore scene—added.

When to Use Double-Exposures

by
Walter Blanchard

DDOUBLE-EXPOSURE can be more than a cinematic trick; it can enable us to tell things which could not so effectively be told in routine scenes. Double-exposed scenes are naturally harder to make, but they are often valuable footage-savers.

Reduced to the most elementary terms, multiple exposure consists simply of photographing a scene, stopping the camera and winding the film back to the starting-point, and then exposing on some other action which we want to see superimposed upon the first shot; the result may be an obviously twice-exposed scene, or an apparently normal picture in which the same person appears twice, according to the methods we use.

Double-exposure work is naturally easiest in a camera which permits winding the film backwards. The Cine-Kodak Special is one of these outfits, also the late Victor Model 5. With these cameras, all that is necessary is to keep accurate note of the footage-meter's reading at the start of your No. 1 take. When the camera stops, slip the lens-cap onto the lens, and wind the film back until you have rewound the proper footage. All there is left to do is to remove the lens-cap and make your second exposure, making sure, of course, that the two scenes end together.

If your camera won't wind back the film, you can still make double-exposures, but you will need either a dark-room or a changing-bag. Before you make your first exposure, slip the camera into the changing-bag and make a little notch in the edge of the film (not too big!) at some definite point; I would suggest notching either just above or just below the aperture-plate, so that any variation in the size of the film-loops will not make your matching inaccurate. Then shoot Take 1 in the usual way, again keeping careful note of the length of the scene. Then—back to the changing-bag. It isn't hard to re-wind the film back to the original starting-point, for you will have the notch cut in the edge of the film to tell you when that point is reached. Re-thread the camera (still in the dark) with the notch in its original position—and you are ready for Take 2. Once you've got the hang of it, you can make triple, quadruple and even more multiple exposures surprisingly easy. But—one word of warning: if you use this film-notching method, be sure to always have your notched starting-point at the same place in relation to the aperture!

So much for simple superimposed effects. Suppose you want to get what the professional calls a "split-screen" effect, in which the background is normal, and the double-exposure consists in having the same person appear twice in an apparently normal shot? This calls for the use of a matte which will cover up one side of the frame, so that you expose only half the picture of each take. The place for such a matte is right in front of the film, as close as is possible without actually scratching the emulsion. The Cine-Kodak Special has a matte slot into which the thin metal masks can be slipped; but with other cameras, you've got to improvise your own mattes. You might think that by simply covering up half of the lens, you would get the mottled-off effect you want; but this is not the case, for covering half the lens will only cut down the amount of light reaching the film, without in the least obscuring the picture. To actually block off part of the frame, you must use a matte in the aperture. If you plan to do a great deal of split-screen work, it may be worthwhile to take your camera to a really good cinemacamera-mechanic, and have a regular professional matte slot cut into the case; but for most ordinary purposes, simpler and less expensive methods can be improvised. In some cameras, like the Filmo, you can easily fit a little round plug into the circular hole between the shutter and aperture, and either cut the matte in the plug, or by making the plug tubular, with a retaining collar screwed into it, fit interchangeable mattes made of small discs of thin, dark metal, cut to the desired shape. In some cameras, this hole in front of the aperture is threaded, so your matte-holder can be threaded to screw into it, assuring a light-proof joint; in other types, a fairly snug-fitting holder of soft rubber might be better. In the Model B Cine-Kodak, the front aperture-plate is removable, so you can fit your mattes directly onto the aperture-plate, making them of opaque tape, or of thin, blackened shim-metal, held in place with scotch tape.

In any event, two mattes are needed: one to cut off the

Continued on page 129

Optical Tricks You Can Do

by
Jerome H. Ash, A.S.C.

DID YOU ever see a close-up of a person, with a number of smaller reproductions of the close-up revolving around the edge of the picture? It sounds like a terribly intricate trick; but actually it can be done very easily, in any 16mm. or 8mm. camera, with the aid of a simple gadget that anyone can build for little or no expense.

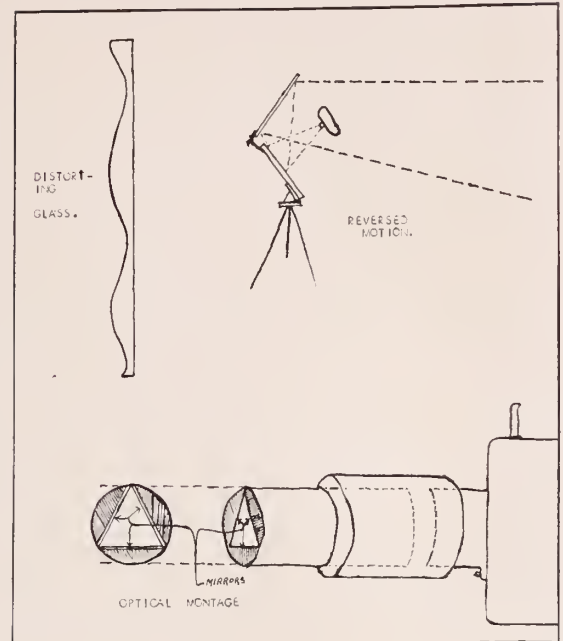
The device works on the principle of the kaleidoscopes we used to play with when we were children. With it, we can get a picture in which the center, which gives us the normal shot of our subject, is triangular, five, six, or eight sided, and with a corresponding multiplicity of smaller images of the subject either standing still around the center, or revolving around it.

The first thing to get is a cardboard tube about the size of the front of your lens. The cardboard can be from a roll of toilet-paper or will do excellently, or if you want to be esthetic, a cardboard mailing-tube. The tube should be four or five inches long—just how long will depend on the focal length, angle, etc., of your lens.

Next, get some strips of the thin strip-mirrors used in making ornamental flowerpots, furniture, and the like. These should be the same length as your tube; the width will depend on the size of the tube, and the number of sides you want your central image to have. If you want to start out simply, choose a triangle, and get three mirror-strips, just wide enough so that the three will fit snugly into the inside of your tube. Pack the rest of the tube with plastic wood, gesso, or the like, and fasten the mirrors into place. Then make up a little cardboard collar which will slip over your lens-barrel at one end, and over your tube at the other. The collar should overlap the tube considerably, so your kaleidoscope will be well supported: it should not, however, be so snug a fit that the tube can't revolve easily.

That's really all there is to it. Of course, if you are one of those home-workshop fans, you can turn the tube and collar out of wood, metal or bakelite, and make it a lot better looking; but the cardboard one will do the trick quite as well, and cheaper.

Using the device is simple. You simply slip it onto your lens, and there you are! In shooting, for instance, a close-up (the trick is usually most effective with close-ups) the actual center of your picture is photographed in the normal way, and you get a normal close-up. The edges of the frame, though, pick up the various reflections and re-re-



flections of the subject in the little mirrors, so if you use three mirrors, you will have a triangular center, with about 18 smaller images of the same thing ringing around it. Naturally, these won't be as well-exposed as the direct image—the re-reflections will be darker than the reflections—but if your exposure is good, they will all show up interestingly.

If you want the outer images to revolve around the center, simply revolve the tube. I've found a very handy way to revolve the tube smoothly is by wrapping a bit of string around it, and pulling on the string.

If your camera is one which, like the Cine Kodak Special, permits you to wind backward, and to use mattes for double-exposure work, you can get some added effects by working out a pair of mattes which will permit you to use the center image for one exposure, and the reflected images for the other exposure. That way you could, for instance, show a close-up of a young man in love, obviously thinking of his sweetheart, who is seen in a dozen or more smaller images, revolving bewilderingly around his head. The more mirrors you use, the more of the smaller reflections you'll get.

Another interesting optical trick is done by the aid of a small piece of clear, flat glass, which you have had ground by a glass-shop so that one side, instead of being flat, is rippled. The ripples can be large or small; large ones, I think, give the most interesting effect. The glass itself needn't be large; I'd suggest making it about the size of one of Harrison's fading-glasses, so that it can be used in a Harrison sunshade. As the curved parts of the glass come in front of the lens, you'll get all the effects of an amusement-park distorting mirror. You can use it stationary, or (and this is best) you can slowly slide it past the lens, either up and down or across. The entire picture will undulate and distort itself, stretching and shrinking. I've used this gadget a number of times to give an earthquake effect.

Here's a trick I used in making "The King of Jazz." Two of the leading players were the "Sisters G," a celebrated dancing team of two beautiful girls, as alike as twins. One of their sequences we introduced with a close-up of the girls, showing only their heads—but the heads were multiplied by two—two heads being upright, the other two inverted.

Continued on page 130



A HANDY GADGET

Recently, I built a dual turntable outfit to add to the enjoyment of my hobby, movie making. After trying my films out with music and sound effects, I found I had several problems on my hands. Number one, was to find a way to quiet my projector. The noise of it was distracting from the music. The other problem was to either move to a larger apartment or find some way of condensing my movie paraphernalia. What with one table for my turntables, amplifier, and stock of records, another for my projector and reels, it was getting so that there was no room left for guests. The enclosed pictures show you how I solved my problems.

The combination projection, editing, and sound cabinet originally housed on Atwater Kent Bottery Radio Set, and was purchased from a used furniture dealer for the sum of one dollar. The cloth back of the speaker grill was removed and replaced by a sheet of thin plate glass.

A small platform was built to bring the projector lens up to the window. A board, the same dimensions as the top of the platform, bolted loosely in the middle to the platform, allows the projector to be turned around to be threaded.



ed. I cut a hole in the top of the cabinet just above the lamp house. This allows the warm air to shoot out into the room. A hole just above the turntable section of the cabinet makes an inlet for the cool air. When running the projector for three or four hours continuously, I usually, as an added precaution to prevent the film from drying out, place a small bowl of water with a sponge in it inside the cabinet.

The cabinet is wired with four electrical outlets. This takes care of everything including a neon lamp which I use as a pilot light for threading and changing



ing reels. The back of the cabinet was covered with a three-ply board. This I cut in half, attached hinges, and made doors out of it. In operation, everything works like a well oiled machine. The reels for the evening's show, are kept inside the cabinet. The records, in the order that I want them, are stocked on top of the cabinet, so you see there is a place for everything, and starting the projector, I close the doors and shut out ninety per cent of the noise. I am now free to give my undivided attention to



the musical end of the program. The amplifier controls in the cabinet are turned up so that I need never bother with them. All fading in and out, etc., I do with the pick-up arm controls.

When the show is over, I rewind all reels, put the lid on turntable case, push the cabinet back against the wall, and there I have a piece of furniture instead of a lot of cases lying around.

When you want to do your splicing and editing, pull up a chair, pull down the drop panel, and you are all set to go.

To me, living in a small apartment, this thing is a boon. From the pictures, you will see that it is a Model 60, 8mm projector, but this idea could just as easily apply to a 16mm machine.

Very attractive radio cabinets can be bought for two or three dollars, but you must go to storage warehouses or used furniture dealers to get the old bottery-set cabinets, as they are the only ones long enough to accommodate two phonograph motor systems. I am sure that there are very few cities in the country where you can't pick up cabinets for a mere song.

—ARCHIBALD MACGREGOR.



HERE'S HOW

by A. S. C. Members

"I have tried making a shot of my wife sitting in front of a mirror, showing her in the foreground, and a front-view of her face reflected in the mirror. But I can't get a good focus. What should I do?"

—L. A., Kansas City.

In photographing reflections in mirrors, most amateurs make the mistake of focusing on the mirror itself, rather than on the object reflected. That is, if your mirror is five feet from the lens, and the subject three feet from the mirror, your focus is not the five feet to the mirror, but the distance from lens to mirror to subject—in this case, five feet plus three feet, or eight feet.

Where the difference between your foreground, which you want in focus, and the subject reflected in the mirror, is too great to be accommodated normally, split the difference in focusing your lens, and stop down as much as possible, to increase the depth of focus.

When you are working close to a mirror, you will sometimes be troubled with a double reflection, one image from the silvered rear surface, the other from the front of the glass. Again, stop down and split the focus. The same procedure is sometimes necessary when using a pane of plate-glass for reflecting, as suggested in an article the writer recently contributed to this magazine.

—Jerome H. Ash, A.S.C.

"What is the best way of making wipes with my Cine-Kodak Special?"

—W. B., Beverly Hills.

Probably the best way of making wipes with the "Special" is to use a mechanical wipe device, like the Du-Morr. Several articles have also appeared in these pages telling how to make such a gadget yourself. The principle is simple: just gear a forward-extending shaft to the hand-crank of your camera (Meconogears will do quite well for this), and fit some form of slip-clutch so you can throw the device in and out of gear. The wiping blade will fit onto the forward end of the shaft, and when you slip the clutch in, the blade will travel into the scene. The blade should be reversible, so that you can make double-exposed wipes, wiping one scene off with the other.

If you don't want to do this, the best

thing to assure even wipes is to fit a framework onto the front of your camera so that the wipe-blade will be several inches in front of the lens, and give a good clean line. Have the support for the blade colibroted, and time your wipe by counts. If you start with your wiping blade clear out of the picture at "one," and finish with it obscuring the picture at the count of "ten," clearly at "five" the blade should always be half-way through its travel. A little practice will enable you to make well-timed wipes by hand this way; but a mechanical device is always better.

—Vernon Walker, A.S.C.

"My interior scenes are well-exposed, but they look awfully flat. What's the matter?"

—I. C., Brooklyn, N.Y.

From your description, it seems that your scenes are flat because you have used a perfectly flat lighting, the same on both sides. The remedy is simple: use a little more light on one side than on the other. You can do this either by using two lamps on one side, and one on the other, or by putting one lamp nearer the subject than the other.

—L. Guy Wilky, A.S.C.

"Can I have duplicates made of my Kodachrome pictures?"

—B. B. S., Savannah, Ga.

It is not possible as yet to get color duplicates of Kodachrome film, though in time such a service may be available. Several laboratories are understood to be making black-and-white duplicates from Kodachrome with excellent results; but it must be understood that these duplicates are in black-and-white, not in color.

—Charles G. Clorke, A.S.C.

"Which of the 8mm cameras is the best for stop-motion animation work? Is any 8mm camera fitted with a single-frame movement?"

—W. D., New York.

We can hardly recommend any specific product in these pages; but all of the "8's" are excellent cameras. We do not believe that any of the regular 8mm outfits has a built-in single-frame movement, but a single-frame control can readily be added to almost all of them. The manufacturer of the camera you choose could probably fit such a device for you on special order; and at least one electrically-controlled single-frame device is commercially available.

—Wm. Stull, A.S.C.

"I had a Filmo 75 for many years, but recently acquired a Filmo 70. All of the films I have made with the new camera are badly overexposed. What is the reason?"

—J. W. C., Portland, Ore.

The Filmo 75 has a shutter-aperture of approximately 135°, while the Filmo 70 has a much larger opening—216°. So while you were probably using the same lens-settings you customarily used with your earlier camera, the shutter of the new camera was letting in a lot more light. Figuring it out as a matter of exposure-time, the 135° shutter gave you an exposure of about 1/42 second, while the 216° shutter gives 1/24 second. This is quite enough to account for your trouble. The remedy, of course, is to stop your lens down to a smaller opening, reducing the amount of light reaching the film.

—Jackson J. Rose, A.S.C.

"I have a screen three feet wide, but in my living-room, where I most frequently project my films, I haven't room enough to get the projector far enough from the screen so as to fill the screen. I have about 12 feet to work in, and the biggest picture I can get is less than 27 inches wide. How can I fill my screen without moving into a new house?"

—E. Y. J., Pittsburgh, Pa.

Evidently you have a 2" lens on your projector. To enlarge a 16mm frame large enough to fill your three-foot screen with this lens, you would have to have the projector nearly 16 feet from the screen. However, by using a projection lens of a shorter focal length, you can get a larger image. If you get a 1" lens, you can comfortably fill your screen with an eight-foot throw; if you get a 1½" lens, you can get the three-foot picture with a throw a few inches shorter than your present twelve feet.

If you don't feel in a position to purchase a new lens immediately, you can probably fill your screen by using a mirror. Set the projector up at right angles to the direction in which you really want to project, and use a good mirror to bend the light around the corner of the screen. Using a mirror less than a foot wide, you can add the necessary four feet to your projection throw by projecting four feet across the room to the mirror, and then twelve feet down the room to the screen. When using this trick, you must of course

Continued on page 124

Films I Have Used

by
Elmer G. Dyer, A.S.C.



DID YOU ever sit back and think about the films we used to use (and be darned glad to get!) just a few years ago? Orthochromatic emulsions, not much faster than today's positive, and hardly more color-sensitive—badly perforated—unevenly coated—incredibly contrasty—and as grainy as a flour-mill. There were no factory experts on hand to help us with our troubles, and when anything went wrong with the film it was just too bad, for the manufacturers were usually far too impressed with the importance of their product to admit a mistake.

It doesn't take much stretching of the memory to recall the days when there was just one kind of film (two, if you counted positive), and you had to shoot your scene on that one emulsion. Today, you've got about a dozen different types to choose from: Ortho, regular pan, superpan, Super-X, fine-grain background pan, Infra-red sensitive pan, reversal background pan, variable-density recording stock, variable-area recording stock, duplicating stock, bipack red-ortho, and at least half-a-dozen varieties of positive, clear and tinted. And if you can't suit yourself from one manufacturer's stock, just step next door and try his competitor's assortment. If Eastman doesn't make what you want, DuPont or Agfa may—and if none of them do, they will probably be glad to make it for you!

Most of us are so accustomed to regard film as a matter-of-fact incident in our work that we never think of the amazing way the raw film industry has grown up about us. At the turn of the century, Eastman and Lumiere were about the only manufacturers of motion picture film. Their first commercial product wasn't even orthochromatic, and the rolls were about 50 feet in length. In 1901, all the film-factories in the world produced but 29,000 feet of negative film per week; by 1930, with probably fewer firms making film, negative production was approximately 65,000,000 feet per week. Or, to put it in more easily understood figures, the factories were turning out 156,000 miles of film every week. You'd think that this tremendous production would keep two or three dozen factories busy, wouldn't you? Actually, most of this footage comes from three main factories—Eastman, Agfa-Ansco, and DuPont, with negligible amounts dribbling from a few smaller makers like Gevaert in Belgium and Zeiss and Perutz in Germany.

On the other hand, any list of the old-time film-brands would include Eastman, Ansco and Bay State here in America, Lumiere and Pathe in France, Ensign in England, Cappelli in Italy, Gevaert in Belgium, and Agfa, Goertz and Perutz in Germany—a total of thirteen. For once, 13 proved an unlucky number, for see how they've shrunk: DuPont and Pathe have joined forces, and Agfa and Ansco; Perutz seems to be restricted to Leica film, Gevaert is

rarely heard from—and the rest have (as far as cinema film is concerned) vanished completely.

And how different was buying film in the old days! Of course, my recollections don't go quite back to the days of the Patents Company, when a film-buyer had either to show a licensed camera or bootleg his film: but I can recall the time when J. E. Brulatour, whose name is synonymous now with Eastman Film, was the American agent for Lumiere film! In those days, and for many years after, buying film was quite a formal affair. You went down to Brulatour's office, and placed your order with Perry Conner (who took your money at the same time). Then Perry would send back to the factory for your roll of film, which—in due and deliberate time—would be manufactured and shipped out to him, and in turn delivered to you! The process was the same whether you were (like me) a struggling free-lance cameraman who wanted 200 feet of film, or a big studio which wanted 200,000 feet. I think it was Frederick L. Kley who, as manager of the Lasky Studio, finally convinced the Brulatour organization that there might be some advantage in keeping a few feet of film in stock here in Hollywood.

One of my more embarrassing moments came a number of years ago when I was on location in Northern California, shooting an extra camera on a big picture. After an especially important day's work, I received an explosive telegram from the laboratory because I had apparently been fading out at about fifty-foot intervals, and fading in five or ten feet later. Usually, the fades seemed to come right in the middle of the scenes! Now I knew I hadn't been playing with the dissolver, and I was just as sure that the camera itself was in first-class condition. Just the same, I was in the dog-house for a long time—until someone discovered that in the particular batch of film my roll had come from, the emulsion was only partially coated, disappearing completely at fifty-foot intervals!

Perforations gave us a lot of trouble, for there were a number of different standards—square, round, and something resembling our present rectangular hole with rounded ends. If you got film perforated wrongly for your camera, you were just out of luck! Most of the studios used to buy their film unperforated, and perforate it themselves. The Biograph people went even a step farther than that: their old Biograph camera took unperforated film, and perforated it as it made the picture!

And speaking of perforations, framing was another fruitful source of grief: some cameras had the frame lines fall between the perforations, like our present standard, while others had the frame line even with the sprockets. Another incident related is that when the first Lasky picture—the original version of "The Squaw Man" was finished, it was suddenly discovered that Cameraman Gandolfi had used two cameras, each with a different frame-

Continued on page 128

WINNERS

GRAND PRIZE: \$250.00 Cash • Dr.
F. R. Loscher, Los Angeles, Calif., for
his 8mm picture, "Red Cloud Rides
Again."

1935 Honors

Again

CINÉ-KODAK EIGHT COMES IN FIRST

Dr. F. R. Loscher of Los Angeles won the Grand Prize in the 1935
American Cinematographer Amateur Movie Contest with his
Ciné-Kodak Eight, Model 60.

Mr. T. Okamoto of Japan won first prize for Photography with
his Ciné-Kodak Eight, Model 20 . . . the same camera with which
he won this same prize in the 1934 contest.

..and both used Ciné-Kodak Eight Film

EASTMAN KODAK COMPANY, ROCHESTER, N. Y.

Wheels of Industry

New Film Splicer

● A new Bell & Howell Film Splicer for 16mm silent, 16mm sound, and 8mm film is announced.

As with the Laboratory Splicer, each film end is located on pilot pins once only. After each film end has been placed between its pair of clamp plates, the emulsion is removed from the left film end with a dry scraper. Then cement is applied, and the right clamp plates are immediately lowered, shearing both film ends and bringing the bonding areas together in a single operation. A lock maintains the pressure until the splice has set—a matter of seconds.

The new splicer, known as Model 136, makes the exclusive B&H diagonal splice. Its pilot pins engage perforations on one side of the film only, so that 16mm sound film and 8mm film are handled as easily as 16mm silent film.

Model 136 has a cast metal base designed to take, as Add-a-Unit equipment features, a B&H Direct Viewer, or a two-way Rewinder, or both, in the same way as the previous amateur splicer. The Direct Viewer, equipped with a light, lens, and ground glass translucent screen, magnifies the film images for the operator's convenience in finding cutting places. Rewinder units are available in either 400- or 1600-foot reel capacity.

B&H Safety Film Cement for Splicer 136 is supplied in a new, improved bottle. The small neck of this bottle reduces evaporation. The brush is attached to a screw cap which gives positive sealing.

Sound Film

● Two new single-reel 16mm sound films of the South Seas, photographed and narrated by Arthur C. Pillsbury, are offered by the Bell & Howell Filmsound Library.

"Life in the South Seas," a trip to the Samoan Islands, shows in detail the life of these happy-go-lucky wards of Uncle Sam, and presents time-lapse photography of the development of the coconut plant and the uses to which it is put. The building of the South Sea Islands by two widely different methods, coral and volcano, is portrayed.

"Life Under the South Seas," the second film, shows undersea diving with water-tight motion picture equipment and the photographic results; time-lapse pictures of starfish, anemones, barnacles, hydroids, jellyfish, sea pens, sea urchins, and many kinds of fish.

Leica Exhibit on Tour

● The Second International Leica Exhibit is now on a tour of some of the principal cities in the East. This collection of outstanding Leica pictures includes prints by famous professionals as well as amateurs. The range of sub-

jects treated and covered includes an almost unbelievable variety of photographic activities. Candid, news, clinical, scientific, color, aerial, pictorial, portrait, surgical—are just a few of the many uses to which the Leica serves, as shown in this exhibit.

In connection with the Second International Leica Exhibit, a local Leica contest is held in each city. Local Leica-ites are invited to submit their best prints in competition for merchandise awards and prizes. The itinerary of the Second International Leica Exhibit is herewith given, and interested readers should secure complete details from their local photo dealers who will be in possession of the final details by the time this appears.

Cleveland, Ohio—Mar. 3rd to and including Mar. 7th Higbee Co.—Lounge Room.

Detroit, Mich.—Mar. 10th to and including Mar. 15th.

Chicago, Ill.—Mar. 18th to and including Mar. 24th. Blackstone Hotel.

Milwaukee, Wis.—Mar. 27th to and including Mar. 30th.

Minneapolis-St. Paul, Minn.—Apr. 2nd to and including Apr. 6th.

St. Louis, Mo.—Apr. 9th to and including Apr. 14th. St. Louis Public Library.

Indianapolis, Ind.—Apr. 16th to and including Apr. 19th.

Cincinnati, O.—Apr. 22nd to and including Apr. 25th. Netherland Plaza—North Exhibit Hall.

Columbus, O.—April 28th to and including May 1st.

Pittsburgh, Pa.—May 4th to and including May 9th. William Penn Hotel.

Baltimore, Md.—May 12th to and including May 16th.

Washington, D. C.—May 19th to and including May 23rd.

Philadelphia, Pa.—May 26th to and including June 3rd. Boyer Galleries—Broad St. Station.

16mm Film Sources

● Victor Animatograph Corporation has issued their Fifth Revised Edition of the Victor Directory of 16mm Film Sources.

This is the most complete and comprehensive work of this kind that we know of. It is the effort of the publishers of this book to list all known sources of 16mm silent and sound films. It is claimed that practically the only sources not included are those that refused permission to list them in the Directory in spite of the fact that these listings are free of charge and entirely without obligation.

This Directory is indexed and made as comprehensive and easy to use as it is possible to make a directory. It will be sent by Victor Animatograph Company, free of charge to present

and prospective owners of 16mm equipment requesting it. Distribution is from the Advertising Department of the Victor Animatograph Corp., Davenport, Ia. Free distribution is limited to one copy per person. If additional copies are desired, they will be supplied at 50c each.

Soft Focus Lens

● According to an announcement from Burleigh Brooks, he has placed on the market a Rolleiflex lens accessory known as the Duto Rolleiflex Soft-Focus Lens. From the description it appears that it is only necessary to place this over the regular lens, the same as a portrait lens is attached. It apparently does not take the place of the existing lens.

Here's How

Continued from page 121

reverse the film in the projector, threading it with the emulsion AWAY from the lens instead of toward it, so that left and right will be in their proper relationship in the projected picture, and the letters in titles will be readable. Don't worry about the mirror in focusing: just focus in the usual way until the picture is sharp on the screen.

—Dwight Warren, A.S.C.

Shooting a Prize Winner

Continued from page 115

for reinforcement. These were of various sizes and were very hard. I have learned that every amateur should have some kind of softer reflector for front lighting and faces because many times the hard silver reflector will give too much light. Many of our Indian shots were taken without the use of reflectors because through experimentation it was found that our make-up could be burned out and we would entirely lose our Indian make-up, so in most cases they were back-lighted with very little front light.

For my personal screening of this picture it is accompanied by a musical score, supplied by phonograph records. During the opening sequence the music is of slow rhythm, gradually increasing to an Indian war dance, then as the covered wagons appear, of course we must have a medley of "Oh, Susannah," as no wagon scene is complete without this well-known selection. Then in the battle sequence we raise to a very dramatic pitch which gradually tapers off to return to the opening rhythm for the final part of the picture. We were able to cover the entire picture with a selection of only four recordings which is a thing that should be done if possible, because of the ease of changing these records during the running of the picture.

The making of this picture was not only a great deal of fun for all who participated, but it was an education as well. It was the first picture of this type that I had ever attempted, and I look forward to the possibility of trying something similar in the future.



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FILMS I HAVE USED

Continued from page 122

line; and part of the picture framed one way, part the other. For a while it looked as if the whole venture would be a total loss. Finally Cecil De Mille and some of the technicians took the negative back to the Lubin Laboratory in Philadelphia where they cemented blank celluloid strips along the edges of the entire negative—and reperfected the whole film by hand!

When you compare the way we shot our early-day film and the methods we use now, the matter of exposure stands out amazingly. With our old, ultra-slow emulsions we used to stop down to around $f:45$ (yes, I mean forty-five!) on exteriors. Today, with an infinitely faster film, we don't use nearly such small stops—in fact, we don't often have 'em on our lenses. $f:16$ or $f:22$ is regarded as stopping down a lot, while often we open the lenses 'way up—even shooting wide open at $f:2.7$ —and a reduced shutter-aperture. What's the answer? Changes in laboratory methods, of course. In those old days, they used developers which were so strong that a modern film would develop if you only waved it over the tank—and they steeped their film-racks in that dynamite soup. The result was a negative that looked almost as black as a piece of steel, and was a matter of soot-and-whitewash contrast. Grain? Nobody gave it a thought—but it was terrible, judged by modern standards. No wonder folks called them the "flickers," and complained of eyestrain!

I haven't the courage to open the argument over who first introduced Panchromatic film. Besides, Joe DuBray, A.S.C., told me the other day that when he first came to this country for Pathe, back in 1909 or 1910, Pathe had a film that was so sensitive to orange as to be almost panchromatic. At any rate, Joe says, it was more panchromatic than the Verichrome and Plenichrome emulsions we use in our still cameras today, so it must have been pretty good. With it, he said, he was able to shoot on days when other companies couldn't, and also later in the yellow evening light. Apparently, that Pathe outfit was a pretty modern bunch, for even back in 1912 or so their Bound Brook laboratory used developing-machines, with spray-washing, and even practiced silver recovery from the used hypha solutions!

My own first experience with Panchromatic film came years later, after the war, when I was one of the first three cameramen to use panchromatic cine film in photographing the Grand Canyon. The film I had was Goertz stock, and it was a mighty good film. I used it for a whole series of travel-shorts I made,

called "The Honeymooners in the National Parks." I still recall that some of those subjects played at Grauman's Egyptian theatre, and (thanks to the Panchromatic film) got unusually favorable reviews.

Of course, the difficulties we had with those early-day Pan films would in themselves fill a book. Laboratory-men would forget they were developing Pan, and develop by red light, pulling the racks out of the tanks every so often to see how they were developing. In one instance, I recall that I got peculiar white flashes every eight feet, caused, I finally discovered, by a laboratory-assistant who carefully loaded the racks in the dark, but stacked them in a corner to await their turn in the tanks—while he calmly smoked a cigarette! The glow of his fag was enough to fog the film at the places where it curved, unprotected, over the top bar of the developing-rack.

No discussion of early-day films and filming is ever complete without mention

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of that bugaboo—STATIC. For the benefit of those whose memories don't go back that far, I'll explain that static was a pleasant, flickery, white marking that looked as though you had inadvertently set up behind a particularly naked and jittery tree. We knew it came from a discharge of static electricity—but we didn't know when or how. And everyone had his own idea as to how to prevent it. Billy Bitzer and others swore by intricate spirit-lamps which warmed the cameras (static only appeared in winter weather). Others advocated—and used—metal cranks which, they said, grounded the camera through the arm of the operator, and so dissipated the static charge. Another man had a tiny metal brush which swept the surface of the film to absorb the charge, while another of the old-timers filled his camera with such an intricate coil of wires that if there had been any radio in those days he could have tuned in Timbuktoo! (P. S.—None of them really worked.)

But I think the only one of them all who really hit the cause and cure of static was Arthur Edeson, A.S.C. He reasoned that static was due to over-rapid changing of the temperature of the film. So when he made any winter exteriors, he would always load his magazines the night before, then pack them into an oil-skin bag and bury them in the snow over-

night. After exposure, he was equally careful about warming the film slowly. And he had no trouble with static, even at times when, at such Eastern winter locations as Lake Placid or Saranac Lake, there would be four or five companies shooting—and all but Arthur getting ruinous static!

The proof of the pudding, so to speak, is the fact that many years later, when Clyde De Vinna, A.S.C., was in Alaska photographing "Eskimo," long after static had been forgotten as conquered, his last shipment of film broke out with a lovely case of static-markings. The film, he says, had been stored for weeks virtually in the open (which was 30° below zero or worse). After shooting, the film had to be rushed back to the California laboratory, so it traveled part way by air, part way on a nice, warm boat (probably somewhere near the boiler-room), partly by train, and partly by air mail—undergoing several very sudden and extreme changes of temperature.

But as far as the rest of us are concerned, Eastman's introduction of "X-Back" film abolished static. This happened about 1915. The "X" backing was some sort of a resinous backing on the film which held the static charge. It's still included in modern films, they say. What was it? No one knows but the Eastman experts—and they won't tell!

When to Use Double Exposures

Continued from page 118

part you want unexposed in the first take, and the other to shield the already-exposed section when you make the second take. The edges of the mattes should be smooth, and the mattes should naturally be exactly the opposite of each other.

Making the shot is simply a matter of inserting the first matte, shooting, re-winding, changing mattes and shooting again. Remember, by the way, that if you want to matte out, say the right-hand side of the picture, the matte must cover the LEFT-HAND side of the aperture, since the lens reverses and inverts the image on the film.

In making split-screen shots, it is absolutely vital to use a tripod, for the camera must be in identically the same position in each shot, or the two halves won't match. It also helps if you pick your camera set-up so that the matte-line coincides with some definite line in the set, as, for instance, the line formed by shooting diagonally into the corner of a room. The action must naturally synchronize, too: the simplest way to assure this is to rehearse carefully, timing both rehearsal and shooting by slow, deliberate counting. If, for example, you have a shot showing your neighbor sit-

ting reading his paper, when suddenly the door opens, and in walks the same man, the seated man must know when to look up and see "himself," while he who comes in at the door must likewise know when to react to his double's surprise. If your actor knows that at the count of five, his walking image will enter, that at nine, the seated image sees the double, and that at ten, the double bows and speaks, it is easy to make the action synchronize.

"Ghosts," incidentally, can be produced the same way, but without mattes except in case some natural person is to be in the shot; the ghost is a simple double-exposure, so that the background will show through the tenuous apparition.

Now, how to use these tricks! Simple superimposed multiple-exposures can be used to show more or less parallel action, suggested by the basic scene. For instance, if we have a girl whose sweetheart has gone out to a Western ranch, and show the girl reading a letter in which he tells what he is doing, we can double-expose shots of the boy over either a shot of the girl reading, or a close-up of the letter. The same idea can be

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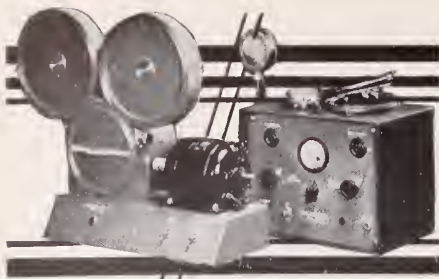
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used to show what a person is thinking about. Let's say Mother is at a bridge-party—but can't recall whether or not she turned off the fire under the dinner dishes: double-expose a shot of Mother playing worriedly, and a close-up of a kettle boiling over on the stove, and you tell the story simply, in half the footage you'd need otherwise. And the same idea can put over something a character is remembering, or show mental confusion, and so on.

Ordinarily, split-screen double-exposure is pretty clearly a trick, and should be used as such. The dual role idea, in which we see the same person beside himself in the same shot, apparently two individuals, is naturally a rather limited dramatic proposition. But split-screen work can be used for other purposes. The most common, of course, is in introductory titles. There, one-half of the split-screen carries a title introducing some person or place, while the other half of the screen shows the person introduced.

This same general type of split-screen can portray parallel action. Say we have

two people talking by telephone: a split-screen shot can show both ends of the conversation at once. Or say our two people are going somewhere to meet: the split-screen can show this, too.

By multiplying our exposures, we can get some very interesting montage effects. For instance, using mattes that divide the screen in quarters, we can show four different things going on at once—and if we want to, we can have any one of the quarter-screen scenes change without affecting the others. Lastly, to make the effect still more "montage-y" than ever, we can add a superimposed full-screen exposure over the others. For instance, say we want to show, quickly, the news of some event being flashed abroad by newspapers. One of our four split-screen shots may show a newsboy (preferably in close-up) crying his "Extra! Extra!"; a second might show the delivery-wagons distributing the papers; a third, a close-up of clicking telegraph keys; the fourth, a shot of a man picking his paper up from the doorstep, while over all would be a shot of papers flowing from a newspaper press.

OPTICAL TRICKS YOU CAN DO

Continued from page 119

The answer, of course, was a mirror. I had two semicircular notches cut out of its far edge, and the girls slipped their heads through these notches. The mirror was slanted slightly down: the lens of the camera was just about level with the farther (and higher) edge of the glass, and the nearer edge slanted down enough so that the entire foreground was filled by the glass. The idea works just as well with one person as with two, though not so bewilderingly of course. The mirror should be held steady during the shot, so the trick won't give itself away.

One of the first cinetricks most amateurs learn is the trick of getting reversed-motion shots by turning the camera upside-down. But it isn't always convenient to use your camera in that position. So why not use mirrors to get the same effect? It isn't hard: simply take a couple of fair-sized mirrors, and place them together to form an angle. The upper mirror reflects the scene you are shooting; the lower mirror reflects the image of the upper mirror, and the camera photographs this lower image which is of course inverted. The upper mirror will probably be slanted forward a little, while the lower glass will slant downward at a convenient angle. You can easily mount your mirrors in little wooden frames, and hinge them together. The lower mirror can then be screwed to a tilting tripod-top, or any other handy support.

And right here, I want to clear up the most important thing in photographing mirror-tricks—focus. Some of the

people who read my last article on tricks with mirrors came to grief because they tried to focus on the mirror, rather than on the object reflected. That is, if you are photographing a reflection in a mirror three feet from your lens, of an object ten feet from the mirror, your focus will be three feet plus ten feet, or thirteen feet. You can easily see how badly out your focus would be if you set the dial only for the three feet from your lens to the mirror! It is also safest to stop down rather well when photographing mirrors, in order to blend the reflections from the front surface of the glass into the main reflection. For the same reason, the thinner the glass in the mirror, the better for your picture.

With mirrors, you can also get some of the effects of split-screen double-exposure shots without having to wind your film backward. Simply take a thin mirror and set it at an angle in front of your lens—preferably several inches in front of it—with the nearer edge on the centerline of the lens. On one side of your frame, you'll get whatever the mirror reflects; on the other, whatever is directly in front of the unmirrored side of the lens. Where you can use a large title-card, this is an easy way of making those introductory titles where on one side of the screen we read, "Introducing Joe Doakes," and on the other we see Joe himself in action. Here again, focus and stopping down for depth are of the greatest importance. They mark the difference between ruining your shot and getting it.

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Balancing Sea and Sky with Filters

Continued from page 114

All too often, when the light was right for me, the wind would be wrong for the sails—and when the wind suited the sails, I'd be faced with a difficult lighting.

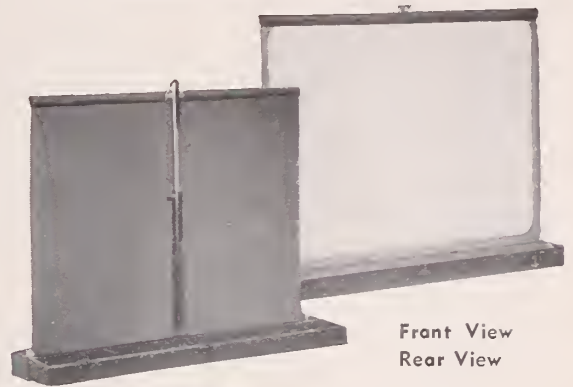
As a rule, a front or cross light is the best; a back-light is sometimes effective (especially for night-effects and sunsets), but it also gives rise to tiny, glancing catch-lights on the waves, which can be very troublesome. Sailing ships and sailboats are probably among the most attractive subjects, but to show them at their best, you must understand lighting. The sails are naturally the salient feature: they should look white, clean and billowy. This effect is best achieved when, if you are photographing from the side or ahead, the sun strikes the sails from ahead; shadowed, the sails tend to photograph grey. Photographed from astern, few sailboats are very pictorial, though square-riggers in a strong, flat light are sometimes interesting. Instead of photographing a windjammer from dead astern, however, when you have to use a rearward angle, try to get a rear-quarter view, as this shows the sails to better advantage. Fore-and-aft rigged boats, incidentally, when you are photographing them from the side, look most effective if you are on the leeward side of them—that is, the side toward which the sails billow.

Lastly, when the main object of interest in your scene is people, use reflectors! Remember that the broad expanse of sky and water is, in a sense, a tremendous reflector throwing light into your lens from all angles, and especially from behind the people. If you place your people so they are in a front light, it is not so bad technically, though the artistic satisfaction is doubtful. But if you have them in a cross-light, or in the shade, if you expose cautiously enough so that the highlighted distance is not "burned up," there will be almost no detail in the shadows. Reflectors, combined with 3-N-5 or 5-N-5 filter will solve this problem. Better yet, if you can, place your actors on the shady side of the deck, and use part of the ship—a deckhouse, or the like—for your background instead of the glaring sea or sky.

Finally, remember that all generalities about marine photography are false—including this one. The one fixed rule is to vary your technique to meet the conditions of each individual shot.

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The Camera Goes 'Round and 'Round

Continued from page 116

SCENE 18: CLOSE SHOT from a low angle from the side, with the camera steady—not panning—of Jimmy as he rides up and down on the board.

SCENE 19: CLOSE SHOT from on the board, directly in front of Jimmy. You can get this by sitting on the board and mustering man power on the other end. We see Jimmy enjoying his ride, the landscape behind him rising and falling.

SCENE 20: MEDIUM SHOT shooting from Junior's seat, straight along the length of the board to frame Sister at the far end. The effect is the same as in Scene 19.

SCENE 21: MEDIUM SHOT, same set-up as Scene 20. Slow your exposure rate down to —. Sister will be seen bouncing up and down at a furious and comical speed.

SCENE 22: MEDIUM SHOT of the merry-go-round. The children run in, scamper aboard and start it in motion.

SCENE 23: CLOSE SHOT with set-up at level of children's faces. As the platform whirls, the children will and by one come in and go out of focus.

SCENE 24: CLOSE SHOT from the top of your borrowed step-ladder placed close to the platform, shooting down on the children as they ride around.

SCENE 25: CLOSE SHOT from a low angle, shooting underneath the platform. Catch the dangling legs of the children as they come by.

SCENE 26: CLOSE SHOT of Junior, if he is tiny, on the platform holding on for dear life and enjoying himself immensely. Keep the camera on him, panning as he moves around slowly.

SCENE 27: CLOSE SHOT from your seat on the platform, shooting across the merry-go-round at the children seated at that side, as the affair goes round and round.

SCENE 28: MEDIUM SHOT of the children riding. Shoot it at 8 and they will spin like a top.

Complete your picture with similar unusual shots of the children playing on whatever other apparatus may be found at the playground. Look always for the uncommon angle and the possibilities of slow—or fast—motion.

As, for instance, if there is a horizontal bar, have the children perform whatever stunts they can execute. Shoot from odd angles, increase or decrease your shutter speed. The results will be hilarious to the children and bring forth

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The Motion Picture CAMERA Magazine



this issue

Controlling Photographic Reproduction
Standardizing Camera Equipment
An Insert-Car for Today
Lighting Economy
... and other features



January,
1936

Published in Hollywood,
by
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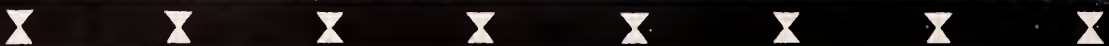


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What to Read

- PROBLEMS of Controlling Correct
Photographic Reproduction
by Dr. Herbert Meyer, A.S.C. 8
- IT'S THE Audience That Pays
by Harry Burdick 9
- STANDARDIZING Camera Equipment
by Emil Oster 10
- AN INSERT-CAR to Meet Today's Need
by Hans F. Kaenekamp, A.S.C. 11
- PROGRESS In Lighting Means Economy
by Wolter Strohm 12

Next Month

- There will be a story from one of the leading Hollywood cinematographers on film . . . film of today and film of yesterday noting the progress made by the manufacturers as well as the technique of the cameramen in using film.
- Also Dr. Meyer will give us another of his articles on the laboratory practice.
- There will be contributions from the leading Directors of Cinematography on their methods and practices.

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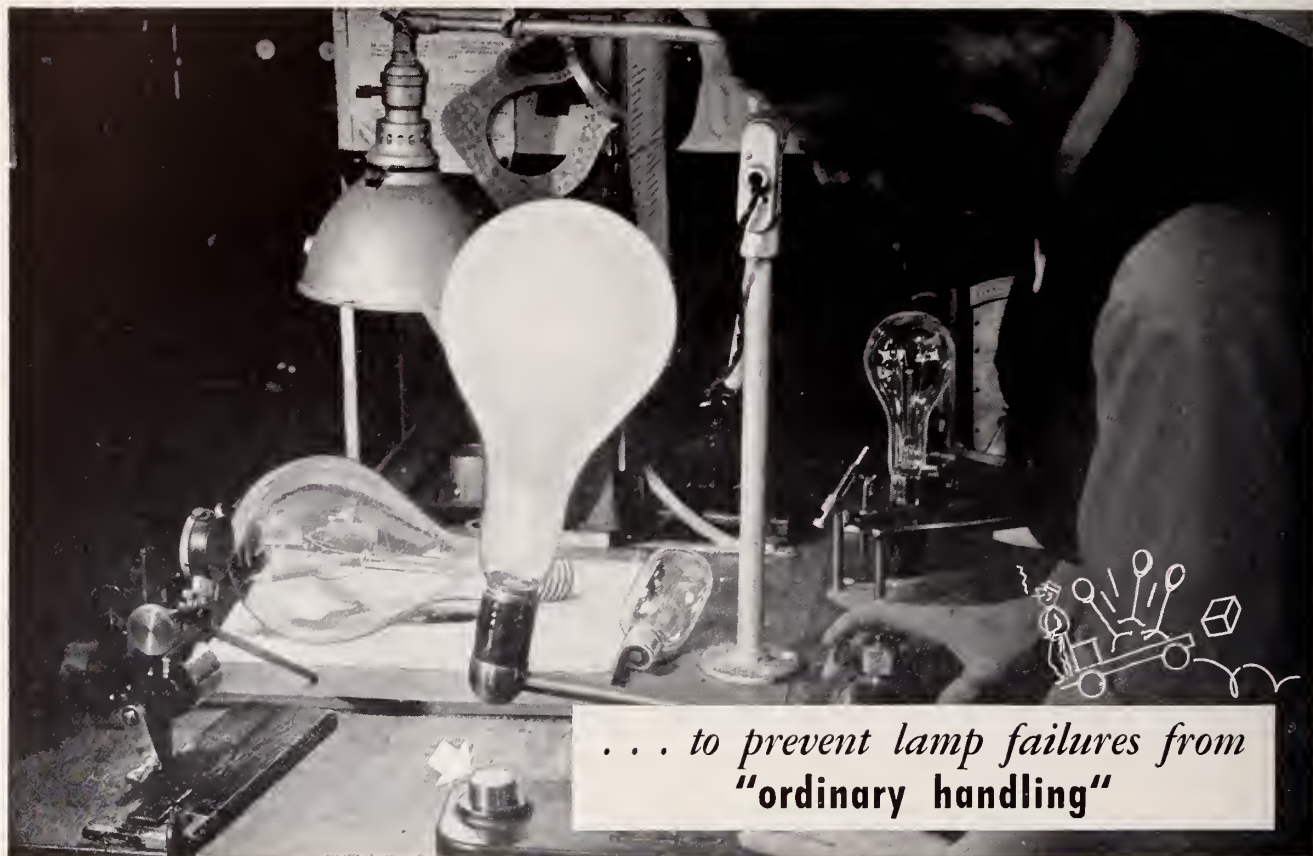
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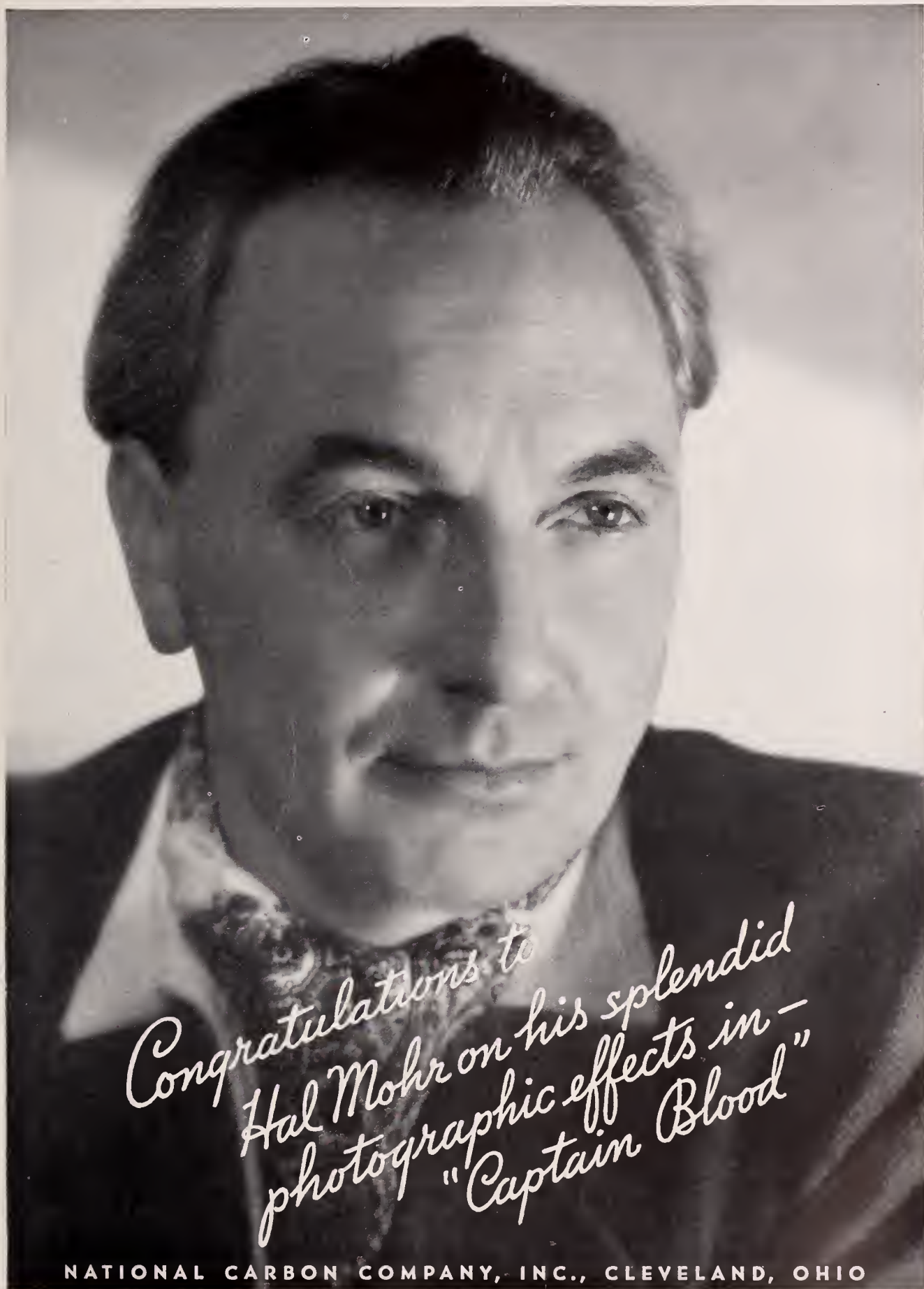
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Problems of Controlling Correct

Photographic Reproduction

PART 2

AS STATED in the preceding article, correct photographic reproduction is accomplished by rendering visual sensation in the finished print identical to that conceived by the eye when the original object is observed. This visual sensation is controlled by the degree of overall brightness and contrast.

If we deal with an object of one even brightness only, which, for instance, is represented by a single color plane, the correct photographic reproduction is very simple depending solely upon a proper relation between the following units:

- Brightness of the object as a function of negative exposure.
- Negative exposure as a function of negative material speed.
- Negative development as a function of negative density.
- Negative density as a function of positive exposure.
- Positive exposure as a function of positive material speed.
- Positive development as a function of positive density.
- Positive density as a function of brightness of reproduction.

When, however, the object is composed of areas of differing brightness values and different colors, which is the case in almost every practical instance, the problem of reproducing identical brightness expands into that of reproducing the correct relation between all brightnesses or visual contrast. This is far more complicated, as will be seen by considering the characteristics which in this case must be placed in proper relation to satisfy correct photographic reproduction.

The total visual contrast in an object can be composed of brightness contrast, hue contrast, and saturation contrast. In ordinary black and white photography this visual contrast can only be rendered in the reproduction as brightness contrast, that is, hue contrast and saturation contrast become zero.

The additional factors of visual contrast and color, when reproducing objects composed of differing brightnesses and colors, require that the following characteristics are kept in proper relation during the processing of the negative and the print:

- Characteristic curve of negative material as a function of visual brightness contrast in the object.
- Color sensitivity of negative material as a function of visual hue contrast and saturation contrast in the object.
- Characteristic curve of positive material as a function of characteristic curve of negative material.
- Overall brightness contrast of print as a function of total visual contrast.

(In this analysis of the problem of correct photographic reproduction the subjective phase has not been included. This would have necessitated the consideration of the adaption level and the color selectivity of the individual observer's eye, referring to the visual sensation created by the object as well as the reproduction.)

Present day photographic technique utilizes many in-

struments and methods for the purpose of properly controlling most of the above relations.

Objective brightness and negative exposure are determined by light meters.

Speed and gradation of negative and positive materials are analyzed by sensitometric instruments.

Chemical development of both negative and positive materials is controlled by sensitometric methods.

Positive exposure is selected by semi-automatic timing instruments which produce a graduated scale test.

There does not yet, however, exist a practical method or instrument which permit determining of the total visual contrast in the object or its three components, brightness contrast, hue contrast, and saturation contrast in relation to the characteristic of the negative material.

The explanation that, even without this important link, the reproduction of satisfactory and artistically beautiful photographic results is possible lies in the fact that artistic satisfaction created by a photographic reproduction is largely independent of the degree of correct natural reproduction. This is possibly due to the many visual sensation impressions received and recorded in our daily lives and which are all of widely different contrast relations, so much so that regardless of our familiarity with the object, our artistic imagination will very likely find the reproduction artistically pleasing no matter how truthfully the original visual contrast has been rendered.

This should not, however, lead to an attitude of satisfaction with our present status, which does not provide a dependable instrument or method to correctly calculate total visual contrast or its components in the object. Regardless of artistic satisfaction, there are many occasions when an accurate knowledge of visual contrast relations would be most helpful, for instance, when pictures are made on location over the length of a full day or of several days which might mean a very noticeable and undesirable change in brightness contrast in the object due to the shifting of the sun or to the natural change in sky conditions.

Before dealing with the possibility of solving the problem of determining visual contrast in relation to photo-

by
Dr. Herbert Meyer, A.S.C.
Head of Hollywood Research Bureau,
Agfa, Ansco Corporation

Continued on page 18



Norbert Brodine, A.S.C.

It's the Audience That Pays—

Reminds Norbert Brodine

by
Harry Burdick

POSSESSED happily of a sharply analytical mind and a flair for delving into economic trends, Norbert F. Brodine carries on his practice of cinematographic art with the shrewd calculation and malice aforethought of providing the greatest amount of entertainment to the greatest number of persons who may give eye to his screened works.

He charts a careful cinematographic-commercial compromise, always aware that, despite the wide sweep of artistry at his command, he must fabricate a commercial product that will go out into the channels of trade and return suitable fiscal returns to its sponsor.

Small-town theaters and audiences comprise the bulk of motion picture audiences. They determine the ultimate financial success of any celluloid drama. Realizing this vital fact, Brodine makes pictures for this greatest audience.

Not that he plays down to any imagined low level of small-town intelligence. To the contrary, he has found it to be the most soundly critical of all audiences. He does, however, make a noteworthy distinction between the professional screen-gazers of Hollywood and New York, and local movie-goer.

It is, of course, a first temptation so to photograph any screen opus in a manner as to win instant applause from immediate studio officials and fed-up film reviewers.

Brodine staunchly rebukes this lure and pushes his horizon back to the ultimate consumer, so to speak. For therein lies the test-tube of the product. And it is significant to observe that so ably does he interpret his dramas to Mr. and Mrs. Average Audience that they win warm acclaim from professional critics as well.

With all the marvelous cinematographic instruments available for use plus a thorough comprehension of the manner in which these tools may be employed to produce epic sweeps of projected beauty, it calls for considerable courage to hew to the straight line of simple story revelation.

Yet, Brodine has found, the nation's greatest audience prefers a straight-forward depiction of action, understood easily and pleasingly, unhampered with cinematographic calisthenics.

He spends vacation periods and odd hours prowling about smaller communities, sitting in neighborhood and village theaters, observing audience reactions. He studies returns from his pictures, with discerning consideration to size and type of theater, and character of its audience.

His observations indicate that the average audience is absorbed in the visual action of screened characters; all other considerations are secondary. So he subscribes to his fundamental of always fully lighting faces. Audiences want to see those faces. He lights them so they can be seen—without exception, even though he must take artistic license at times to do so.

Audiences, he finds, want to relax and have the film's action brought to their eyes. To this end, Brodine makes clear pictures; pictures that can be seen in their entirety without effort; pictures that relate their tales in crisp, vivid sequences.

Though it may seem paradoxical, he has a strong liking for the use of effects. They aid in creating illusion and audiences, he finds, file past box offices in quest of illusion, make-believe, entertainment and escape from matter-of-factness.

But here again he strikes a careful balance between the art effect that contains only sheer beauty and the effect that is, candidly, of commercial worth. He is most solicitous not to, so to put it, over-effect. He draws the apt comparison of a musical composition of such delicate nuance that its charm is appreciated only by a select group of ultra-sophisticates artistically, and one of such intimate, readily-recognized beauty as to sweep into universal acceptance.

Never for a moment does Brodine disregard this cinematographic compromise with the commercialism that pays the bills. An artistic barrier, if you will, but a most valuable consideration in this era of balance sheets.

His observations into exhibitors' conditions, and these

Continued on page 16

Standardizing Camera Equipment

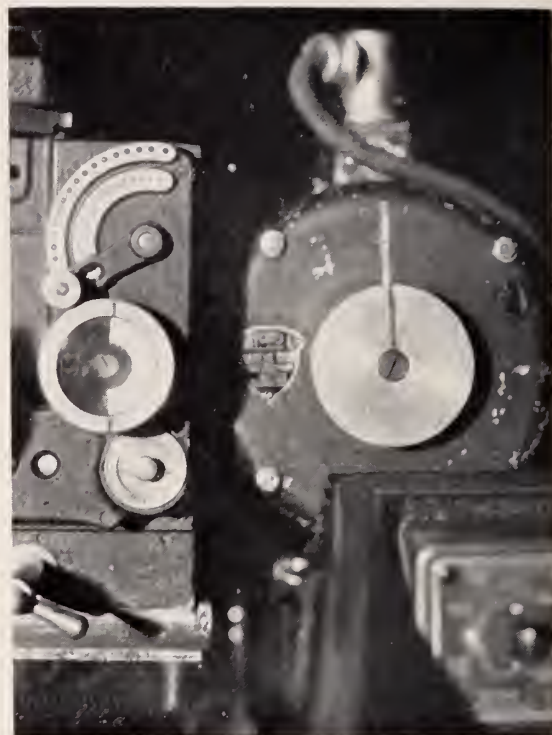
by
Emil Oster

Camera Executive, Columbia Pictures Studio

THE PHYSICAL standardization of camera equipment and accessories is a subject which is very properly receiving more and more attention from the Industry. Such standardization can be of great benefit to a large studio; and it is of vital importance to a smaller plant. This discussion of the subject is necessarily based on the writer's personal experience in attempting such standardization of equipment at the Columbia studio, but the general principles can be applied equally to the problems of a larger plant.

It is just as well to begin by admitting that our policy of standardizing equipment was not due to any particular foresightedness, but was forced upon us by necessity. When I took charge of the Camera Department of the studio, the firm was regarded as one of the Industry's less important plants. Consequently, the equipment available was limited, and financial considerations precluded any hope of an extensive procurement plan. Nevertheless, at times when production was high, quite a bit of additional equipment was necessary. This of course, was rented from individuals and camera-rental firms. And here came the problem: when you rent a camera, you get a good camera, but with little or no special auxiliary equipment. If the studio's own equipment—blimps, dollies, and so forth—is fitted with special gadgets, the rented equipment cannot be used freely unless extra time and money are spent in adapting it to work with the studio gadgets. Clearly, this would not be a good business policy! So the obvious solution is to standardize the studio's equipment and methods so that any commercially available studio camera or accessory can be used without modification.

One of the first things that came up was the matter of "blooming," or fogging the starting-frame of each scene so that picture and sound-track negatives can be easily synchronized. In many studios this is done by a little electric light known as a "bloom-light," which fogs a round spot on the starting-frame. But "blooming" is not a practice common to all studios, so very few rental cameras have a "blooming" system. A simple, but highly effective substitute was found in a routine which can be performed



Grease-pencil marks on motor knob and shutter indicator synchronize any camera with background-projector.

with any Mitchell camera. At the start of a scene, the assistant simply racks the camera over into shooting position, and twirls the motor-knob until the shutter is open, completely fogging an entire frame. This quickly-made "bloom" is not merely as good as the conventional type, but more easily located in the negative or rush-print.

Another problem is the making of projected-background process shots. Unlike most major studios, we do not maintain a separate special-effects department: the production cameraman handles his own process work (except in rare instances where highly specialized trickery may be needed), and he films the process shots right in sequence with the rest of the picture, instead of doing all the process work after the normal scenes are finished. We use portable background projectors and portable screens, which are wheeled onto whatever stage the company may be using.

Under these conditions, it is out of the question to maintain special process cameras and process motors; yet the cameras and motors must be perfectly synchronized with the projector. We have found a simple method of synchronizing with standard cameras and motors, also with standard Mitchell cameras of the newer type, which have a visual indicator at the rear to show the position of the shutter. At the start of a process sequence, the projector and camera motors are phased. The cameraman then notes the position of the shutter-indicator, and with a grease-pencil draws a corresponding line on the motor-shaft knob. That's all there is to it. No matter what may occur during the day's work, the synchronization may be established in a few seconds. The camera may be moved ahead or behind—out of cycle—in reloading, or in making normal scenes between process-shots; but all that is necessary for re-synchronization is to turn the motor-knob until the position of the grease-pencil line on the knob and the shutter-indicator correspond. This can always be accomplished within a maximum of five turns. Once these marks coincide, the camera and projector are "in synk." Similar

Continued on page 14

An Insert-Car to Meet Today's Need

by
Hans F. Koenekamp, A.S.C.

THE PHYSICAL conditions of picture-making today are in many important respects very different from what they were in the pre-Vitaphone era. With the exception of units making "chases" and process key-plates, our cinematographers are working with equipment vastly heavier and more bulky than was used ten years ago. Working technic, too, has changed notably. With regard to the auxiliary equipment used on the stages, the need for recognizing this fact has been readily apparent, and we have an abundance of cranes, dollies, rolling tripods, and the like, all designed and built to cope with present-day problems.

But as far as camera "insert-cars," which are a very important piece of equipment in any man's studio, we have in most cases seen fit to let nature take its course—and struggle along with pre-talkie equipment, usually overloaded to a dangerous degree, and falling short in necessary performance. In a way, this is logical enough, for a good insert-car represents a tidy investment and should be expected to outlast many lesser units. So in many instances, we have tried to get by with old equipment, or with make-shifts in which the larger camera-carrying trucks were pressed into service as photographing cars.

Within the past six months, however, the Warner Bros. studio has developed a really modern insert-car—the first, we believe, which has been designed and built specifically to meet modern conditions. While the machine was designed and built under the direct supervision of Art Klein, head of the studio's mechanical and transportation departments, it represents a combination of ideas gleaned from cameramen, directors, drivers, and virtually everyone on the lot who has ever had anything to do with camera cars. And it is a very successful compromise!

The chassis is a standard Lincoln passenger-car. The regular Lincoln motor, which developed 90-horsepower, has been modified in the studio shops to develop over 135 hp. This was done by fitting new camshafts, a downdraft intake system, and raising the compression. The gear-ratio has at the same time been lowered by installing the same gears used in the Lincoln 7-passenger limousine, which is the lowest-g geared of the line. None the less, the car can



reach a speed of nearly 70 miles per hour, fully loaded, and can tow another car (from either side of the rear) at better than 50mph. The acceleration, of course, is remarkable. Special springs have been fitted, to give the ultra-smooth riding demanded while yet carrying the abnormally heavy loads, and blowout-proof balloon tires are fitted on extra-sturdy 18-inch wire wheels. Thanks to excellent bearings, the car can, if necessary, be rolled by the stage crew like an ordinary dolly.

In designing the camera-carrying features, special care was taken to provide for mounting as many cameras as necessary, to give a wide range of possible angles, and perfect rigidity. There are no makeshift set-ups; the problem of adjusting tripods, tying them down, and so on, is eliminated. Four basic camera-positions are provided: the conventional front platform, rear platform, in the body of the car, and atop the driver's cab. While the cameras are rigidly mounted, the mounts may be adjusted in a wide, and perfectly overlapping range of heights. The underpinning of the mounts consists of tubular, chrome-molybdenum steel railings, across which are clamped U-shaped duralumin bars, upon which fit the mounts for cameras, lights, microphone-boom, etc. These mountings are adjustable in any direction. To take a single one of them, for example: the rear-platform mount consists of four tubular uprights, connected by two longitudinal members which carry the flat camera-bar. By means of clamps, the longitudinal members may be set at any height from platform-level up to over three feet. The camera-bar may be slid forward or back along these rails, while the camera-mounts may be latched at any position along the bar. A supplementary mount, just at platform-level, provides for ultra-low set-ups, when needed, and when the platform is not in use, a removable tubular member across the rear serves as a

Continued on page 17

Progress in Lighting Means Economy

by
Walter Strohm

Chief Engineer,
Twentieth Century-Fox Studios



MAKING moving pictures isn't a question of "getting by," but of turning out first-class product with the minimum loss of time and expenditure for labor and such raw materials as film, electricity, etc. If we can make one lamp do what two were often required for—if we can make 1,000-watt globes out-perform 2-KW ones, we save time, labor, and current (not to mention reducing replacement-charges): and with these savings on one side of the ledger, the first cost of equipment quickly vanishes.

For example, we could probably still "get by" making talking pictures on an old-time glass stage—but who would want to do it? Think of the time and effort expensively lost in adjusting the maze of cloth diffusers over the set—in juggling reflectors around to provide light effects—and of trying to keep a consistent lighting in spite of the ever-changing movement of the sun! Yet, back around 1914 (even later in some instances!) that was so completely the natural way to make pictures that most executives, directors, and even cameramen fought strenuously against the innovation of artificial lighting. In D. W. Griffith's "The Clansman" ("The Birth of a Nation"), which was one of the early films I worked on, virtually the only artificial lighting used was provided by magnesium flares. A year or so later, when I was with Chaplin, just after he left Mack Sennett, the interior scenes were made on a daylight stage, with the sets erected on a revolving platform. Theoretically, all that was necessary to keep the lighting constant was to revolve the platform (and the set) as the sun's angle changed. But each time, a myriad of reflectors had to be readjusted, the diffusers changed, and so on—while the company waited. It was not until the production of "Easy Street" that Chaplin decided that while he might be "getting by" without lights, he would get by a whole lot better and faster under arcs.

The arc, in those days of Orthochromatic film, was of course the most logical choice for studio lighting. Even though few really high-powered incandescent globes were available, some experiments had been made, especially

with the "daylight blue" variety; I made some myself, and I know other individuals and studios, including Universal, had; but with a film that so strongly preferred the blue light of the arc, these experiments were not especially successful.

None the less, they had persuaded me that if the right film could be had, and the right equipment developed, the incandescent lamp would have basic advantages. It would be simpler and easier to use; it would require few, if any, special adjustments, and would stop those ubiquitous gentlemen who feel they can improve any moving mechanism into which they can get a screwdriver or a pair of pliers. And of course, you could do things with an incandescent that you never could with an arc—tuck it away in a cramped space and forget it, point it straight down, or at any old angle, without losing efficiency, and so on.

But it was not until Panchromatic film began to come in that the incandescent was a practical possibility. When that development occurred, I took the bull by the horns, and with the cooperation of Lee Garmes, who was the cinematographer on the production, we made the first feature completely lit with incandescent lamps, at the old First National studio in 1926; the picture, I think, was called "The Rebel." For general lighting, I simply used ordinary floodlighting units such as are used to floodlight any building or sign. But for spotlighting, I had a much different problem. No high-powered Mazda spotlights existed. A simple list of the attempts made with lenses, experimental metal and glass reflectors, and so on, would fill a volume. Finally, thanks in no small way to the untiring efforts of Peter Mole and Elmer Richardson, who had just launched the Mole-Richardson firm, the General Electric Engineers, and others, the ancestor of the present drum-type reflecting Mazda spotlight was evolved. With the facts and figures carefully compiled from actual experience in making a full-length feature under Mazdas, Fred Pelton and I presented the case to the A.S.C. and the Academy, with

Continued on page 16

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Standardizing Camera Equipment

Continued from Page 10

markings, of course, are made on corresponding points in the projector, so that projectionist and camera-crew can proceed independently, confident that when a scene is started, their machines will always be in phase. No telephoning or shouting messages from camera to projector are necessary to establish this fact. The only time that thought of phasing is necessary is when the troupe moves to another stage, fed from a different distributor. Then the phasing and marking operations are gone through again, and work goes on as before. Best of all, the same cameras and motors used for normal production can be used, unchanged, for process work, whether they are studio-owned or rented equipment. Any number of cameras may be used, all in perfect "synk" with the projector.

The matter of such auxiliaries as blimps, tripods and cranes was another difficulty. When camera-booths gave way to blimps, every studio, naturally, devised its own type, to meet its special needs. Sound men, cameramen, and machinists were rather feeling their way along, improvising at every other step. Inevitably, each studio evolved a lot of

special fittings for use with its own blimps. Often, the cameras themselves were extensively modified, sometimes to the point where they could be used only in their own special coverings. Because of our particular equipment problem, we could not afford the luxury of such special blimps and fittings. Our blimps had to accommodate not only our own cameras, but also those we might rent. And the latter could not be changed to suit our blimps!

After a careful study of the blimps commercially available, we standardized on the type designed by Victor Raby, and manufactured by the Studio Equipment Company. We have purchased a number of these, and rent others—from several sources—when we need additional equipment. Any standard Mitchell camera can be used in these blimps, put in or taken out at a few seconds' notice. Our crews have the advantage of knowing that every blimp and camera they may use will fit each other perfectly, without any changes or adjustments, and with no special gadgets to worry about.

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Fortunately, since the time when I entered the Columbia studio, the firm has prospered on, so to speak, come up in the world. More and better equipment

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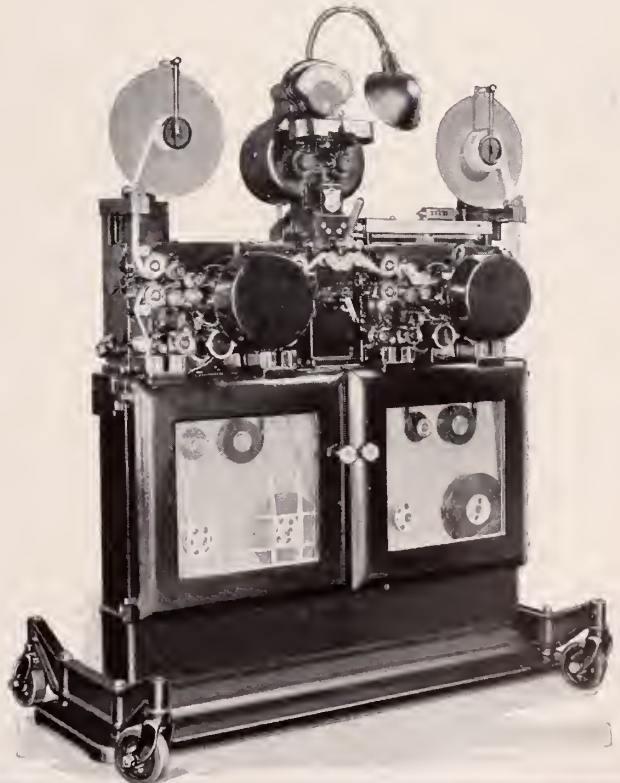
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is now permanently in our equipment lockers; much of the old apparatus has been replaced with the latest and best. But the value of this standardization of practice and equipment is no less great today than it was then. If anything, it

is paying bigger dividends now than it did when we first awoke to the need of standardization; and I do not believe that any studio can ever be big enough to overlook the benefits such a course can bring.

Progress in Lighting Means Economy

Continued from page 12

the result that the two organizations conducted their historic researches into the possibilities of Mazda lighting. The "Mazda Marathon" definitely proved the Incandescence to be superior for use with Panchromatic film; but I doubt if the innovation would have been accepted so readily had not sound arrived to force the issue. The "Inkie" was the only really silent lamp available, and it naturally sprang overnight into general use.

The new Solarspots are just as basic an improvement. In the first place, they really direct their light where you want it—and they utilize the light from the globe efficiently; they don't throw any of it away.

Our conventional 18's don't do this. Even when they are fitted with "spill rings," they scatter a lot of light where it not only doesn't do any good, but where it is definitely unwanted. Putting on the spill ring of course reduces the amount of light-leak, but at the cost of killing off the illumination from the entire front side of the globe. And when you begin to flood the lamp out from its tightest spot, you immediately begin to produce a dark-spot in the center, which increases until at full flood, you have a tremendous difference in strength between the center and the edges of your beam. To get around this, most of us waste still more light by diffusing, and frequently by using two lamps where one really efficient one would do.

These new Solarspots are really efficient. They don't show any dark spots, and I have yet to discover any objectionable hot spots. And their beam is a real beam; the spilled light problem is really and conclusively solved. Thanks to their "Morinc-lens" optical system, they have a perfectly flat field, and utilize almost every possible bit of light that the globe emits.

In practice, this means that in set-lighting, where we would often have to use two of the drum-type lamps, overlapped and diffused, to get away from the dark spots and other failings of such lamps, we only need to use a single Solarspot. In both general and personal lighting, we find that vastly less diffusion is necessary. At present, we are actually using more diffusion than we really should; a 1,000-Watt globe in a Solarspot will turn out more really

usable light than does a 2,000-Watt globe in a reflector-spot; right now, we are using up a stock of the larger globes, and diffusing. When we can standardize on the smaller globes, we will be able to get away from 90% of our present diffusion.

But to me, the really big thing about these new lamps is the fact that the spilled light problem is gone forever. Did you ever stop to think how much valuable time a company loses while the grips "gobo off" this lamp, or hang a "flag" on that one? Well, as we are proving, it runs into real money. With Solarspots, you can place your lamp, focus it—and forget it. No spilled light to give the camera trouble!

But the convincing touch, to me, came when after using these new lamps for several days, a cameraman who had protested the change with all the vehemence of outraged conservatism said, "Walter, I wouldn't have believed it possible to get so much light from so small a lamp. I can get it into places I wouldn't even try to use an 18—and I never saw a lamp that gave a beam so perfect for photography. You were right after all. When can I have some more of them?"

It's the Audience That Pays

Continued from page 9

only too realistically control the studio situation, bring to light other items of engaging interest that may well be borne in mind by those who create cinematographic works.

Not all theaters have projection facilities the cinematographer expects. Many of the smaller halls have insufficient amperage to do justice to scenes heavily diffused. As the result, many a scene that is a cinematographic chef d'oeuvre in studio projection rooms or in the splendidly equipped larger first-run houses and to which the cinematographer points with pardonable pride, becomes a messy and vague puzzle when weakly projected.

There have been sequences, indeed entire productions, done in so low key and with such emphasis on effects that, while winning raves from professional audiences under perfect projection, have evoked protests of downright complaint

and resentment when screened by inadequate equipment.

Bradine is of the firm view that, projection being what it is, cinematographic practitioners must come to the realization that not all of their supreme lens achievements are practical to employ under existing conditions obtaining where the bulk of film profit returns emanate.

All of which factors express the ever-increasing problems confronting the cine-

matographer as he charts the pictorial delineation of a screen drama.

An exact balance, a correct bit of artistic tight-rope walking, is required to satisfy fully the widely divergent classes of audiences that envisage a pictured production the world over.

That Brodine uniformly bows to professional applause for his cinematographic creations without to any degree alienating his run-of-the-mill audiences is voluminous tribute to the searching soundness of his artistic technic.

An Insert-Car to Meet Today's Need

Continued from page 11

guard rail. The mount in the body of the car takes things up from the highest level attainable on the platform to a height level with the cab-top mount, which rises on telescoping rods to a position about eight or nine feet in the air.

The front platform is essentially similar to the rear one, but may be removed, and fixed in a still lower position when extremely low angles are needed. Its framework is rigidly braced by tubular members extending forward from the cab, and by turnbuckle-tightened tie-rods underneath.

Every effort has been made by the designers to allow ample floor-space for the camera crews.

When working with lights, the car carries a small, portable generator which is mounted low enough to be out of the way, and to keep the center of gravity safely low. The side-boards of the car-body are removed, and with them a two-foot strip of the flooring in the forward section of the body. Into this cubicle, the generator slides. When cameras are to be mounted in the center section, special supplementary supporting uprights are put into place just behind the generator, short horizontal bars are connected, and the mounts are used normally.

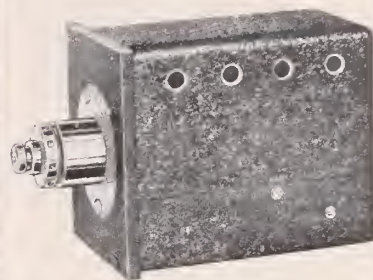
If all four of the camera mounts were used at once, at least eight cameras could be carried; frequently two heavy blimped cameras have been used side-by-side on a single mount, together with such accessories as lights, microphone boom, etc.

Four positions are available for towing other cars, wagons, etc., when such inserts are not to be made by the more general background-projection process. Heavy tubular towbars are provided at front, rear, and amidships, by which a car may be towed beside the insert-car, while a ball-and-socket jointed towbar can be mounted behind the rear platform for towing a car directly aft. It is quite possible to tow more than one car at a time. Incidentally, an unusually large and readily adjustable rear-vision mirror is fitted so that the driver

can always see what is happening to his tow.

In a word, the new car provides for any possible camera-angle with a rigidity that could never be approached in the old tripod-and-tie-down fashion. Everything is solidly mounted, yet instantly adjustable; there are no more expensive waits while the technicians improvise something on the camera-car—everything is there when the car leaves the studio, and has been since the car was designed. The smoothness, range of speeds, and pick-up have never been bettered, and the designers have tried to leave nothing wanting with respect to the cameraman's convenience and freedom of operation. Best of all, from the studio's point of view, the device

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Problems of Controlling Correct Photographic Reproduction

Continued from page 8

graphic reproduction, it is necessary to paint attention to the fact that this problem can be considerably simplified if whenever possible the negative exposure level would be raised to a point which would guarantee rendering of all negative densities on the straight-line portion of the characteristic curve. The high speed and wide latitude of present day negative material permits this full exposure under the majority of light conditions. Thus, it is evident that dealing with linear contrast relations only the problem is appreciably simplified, at least as far as the negative is concerned. In the positive print, however, it becomes essential to place part of the reproduction in the curved-toe section to permit rendering of sufficient transparency in the highlights for a faithful reproduction of the overall brightness level.

The article next month will deal with an analysis of visual sensation in comparison to the characteristics of negative and positive emulsions.

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AMATEUR MOVIES

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this issue

International Prize Winners
This Matter of Tempo
Adventures in Kodachrome
Lighting With Common Sense
A New Year's Continuity
... and other features

JANUARY
1936



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AMATEUR MOVIE SECTION

Contents . . .

CONTEST Winners	24
1935 HONORS Split Evenly Between 8mm and 16mm.....	24
THIS Matter of Tempo by William Stull, A.S.C.....	25
ADVENTURING on the Kodochrome Trail by Henry Fonda.....	26
LIGHTING with Common-Sense by Walter Blanchard.....	27
A NEW Year's Continuity by J. Dickinson Reed.....	28
HARMONY In Texture and Design by J. Belmar Holl.....	29
TWO Interesting Gadgets	30
JUST What Is Montage Anyway? by Mox Liezt.....	31
WHEELS of Industry.....	32
NEWS of the Clubs.....	34

Next Month . . .

PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the **AMERICAN CINEMATOGRAPHER**. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

- J. Belmar Holl will give us another interesting discussion on composition. He will treat somewhat from the Dynamic Symmetry standpoint, keeping it, however, in simple language.
- We will give you further information on entrants in the contest and give the list of those who won honorable mention.

1935 Honors Split Evenly Between 8mm and 16mm

FOR THE THIRD YEAR an 8mm picture wins highest honors in the American Cinematographer Amateur Movie Contest.

This year it goes to a new entrant, an amateur who has not been active in our past contests.

While the prizes were fewer this year than in past years, still the competition was more keen than ever before. Last year was considered one of the biggest years; however, the count of both entrants and reels submitted this year more than doubled last year's entries.

The prizes were broken down into four classes, Home Movie, Scenaria, Documentary and Photography. There were four prizes with the grand prize going to the best all-around picture. This, of course, would have to cover a certain classification. In this year's contest it was in the Scenaria Class.

Only one prize remains in this country, the others going to Japan and England, with two going to England.

Again T. Okamoto presented a gem of photography, but close on his heels was R. B. Clardy with "Fisherman's Harbor." Clardy was the winner of last year's and a previous year's scenaria and grand prize.

In the Home Movie class, Van Dee Sickler, who last year won first prize in this category, was very close in points to the winner.

All the way through it was a very close contest. The winners were shaved very hard by those who were runners-up. In some instances the winners achieved their goal by only a few points.

However, you are more anxious to know the type of pictures that won and just what they consisted of.

"Red Cloud Rides Again," the 8mm picture by Dr. Lascher which was given first prize, was based on a poem that dealt with the pioneers crossing the desert. Its main action had to do with a wagon train being attacked by Indians.

The manner in which Dr. Lascher handled this sequence would have done credit to a studio production. With only one wagon, three horses and six people at his command, he made it look like a production employing more in the way of properties and talent.

His angles, his composition and his cutting are things for every amateur to observe. His story could have easily become hackneyed by poor cutting and editing, but he kept it moving at a fine tempo.

"Maads of Nature" by Paul Brunford, recently won a prize in the Institute of Amateur Cinematographers' con-

WINNERS

GRAND PRIZE: \$250.00 Cash . Dr. F. R. Loscher, Los Angeles, Calif., for his 8mm picture, "Red Cloud Rides Again."

DOCUMENTARY: \$150.00 trade Bell & Howell . . . Paul Brunford, England, for his 16mm picture, "Maads of Nature."

HOME MOVIE: \$150.00 trade Victor Animotograph Corp. . . . T. Lawrenson, England, for his 16mm picture, "Happy Day."

PHOTOGRAPHY: \$150.00 trade Eastman . . . T. Okamoto, Japan, for his 8mm picture, "Autumn Leaves."

RUNNERS UP

In the Scenaria class, under the name of Shoestring Productions, Frances Christesen, Perle Eddy, Harry Merrick and Emanuel Goldman were runners up with their 16mm picture, "Chronicle."

In the Home Movie class, Van Dee Sickler of Los Angeles, who last year won the prize in this class, was very high.

The Documentary class presented the greatest competition. There were two runners up. Fred C. Ellis with his picture, "In the Beginning," and Leslie P. Thatcher of Canada, with his picture, "Fishers of Grande Anse." Photography: R. B. Clardy of Los Angeles, with his picture, "Fisherman's Harbor," was very close in points to the winner.

test in England. Not only does Brunford show a fine sense of rhythm, but a keen eye for composition and a splendid sense of cutting and dramatic values in nature. This picture merely deals with a storm arising and then subsiding. Brunford uses both water and earth to show this. The smashing waves, bending trees and waving wheatfields combine to create his drama. His photography however, is something for which he is to be especially congratulated.

In the Home Movie field, Lawrenson submitted a fine document of a day with his little 2-year-old daughter. The main portion is given over to a day at the seashore. But he gives reasons for everything he does even to going home. He shows a storm coming up and after the family has arrived safely at home, the little tot looks out of the window while the raindrops patter on the windowpane.

Okamoto again demonstrates his fine sense of composition, repose and rhythm. Okamoto never hurries his pictures, neither does he hold them too long to bore you. He plans only to give you another fine picture, but he always puts life into his shots. Autumn leaves is a fine Okamoto offering, but in the opinion of the judges it does not contain the same spark of creation as his last year's effort, "Tender Friendship."

The Runners-up also deserve a word of commendation. Some of them showed great ingenuity. Ellis with his pic-

Continued on page 40



Photo by G. M. Best

This Matter of Tempo

by
William Stull, A.S.C.

WEBSTER defines "Tempo" as "rate of movement; specifically . . . the pace at which action or poses move." I suspect he wrote that definition many years before the cinematograph was invented, but he couldn't have better expressed what we mean today by "tempo" in a movie.

It is strictly because of a lack of understanding of this matter of tempo that so many home-movies are "doggie." And right here, let me say that tempo is just as important to any type of home film as it is to the most important dramatic production. The only reason for making any picture is the hope that it will interest an audience. That goes just as strongly for the baby's both or a documentary exhibit

telling how to milk a cross-eyed mule-cow named Molly as it does for your club's thrilling production of "The Hazards of Hortense!" So if you want your films to be interesting, it's a good idea to get acquainted with tempo.

One of the chief advantages of the moving picture is the fact that it permits you to compress time, to suggest a tremendous lot of off-screen action without having to show it. For instance, if you want to put over the idea that I am going East, you don't have to show every step of the way: a shot of me packing, one of me buying a ticket, another of me going through a station gate labeled "Train No. 22—Omaha, Chicago, and Points East," a flash of some New York skyscrapers, and a shot of me unpacking tell the story in about fourteen seconds. From the evidence on the screen, I'm indisputably in New York. You could string the thing out three or four times as long with added detail—but it wouldn't make the screened effect a bit more convincing.

So point Number 1 in tempo is to say what you have to say as quickly as possible, without wasting needless time or energy on gratuitous detail.

Point Number 2 is, don't waste footage even in what you show. In the example just given, for instance, it isn't at all necessary to show me doing all of my packing or to "follow" me after I've passed the station gate. In the first shot, the suitcase can be closed, and the camera picks me up pulling the lost strap tight; then I pick up the suitcase and my hat, and START to leave—it isn't necessary to show me going to the door, opening it, going through, and closing it. In the same way, the shot of the ticket-office can begin just as I hand my money to the clerk, get my ticket, and end when I turn away, while the shot of the trainshed gate need only show me handing my ticket to the gate-mon, after which the camera can pan over to the sign telling where the train goes.

The same holds true for almost any action you can imagine. It is seldom necessary to show a person crossing a room, for a shot of him coming in followed by a shot of him arriving wherever his important action is to be, is usually more than enough to tell the whole thing. In other words, show only the heart of any action—and forget the trimmings.

The physical speed of the action can often help a lot in telling your story. For instance, suppose you want to show, quickly, a person climbing a mountain. You could show him going through a number of different scenes, climbing higher and higher—but that would eat up a lot of footage. Instead you can get just as good an effect in two short scenes by beginning with a shot of him starting off briskly at the foot of the grade, followed (connected preferably by a lap-dissolve a wipe, or fading out and then in) by a scene of him at the top, moving slowly, with his coat slung over his shoulder, and obviously hot and tired.

Carrying this same idea a step farther, you can use tempo to indicate all sorts of emotional impressions. Suppose, for instance, that you show neighbor Smith out for a comfortable Sunday morning stroll. While he is gone, an important telegram comes; his wife reads it and discovers that it contains bad news—so bad she gives the wire to little Willie and tells him to run after his father. By contrasting the slow tempo of long, detailed shots of Popo Smith's deliberate walk with short, quick shots of Willie rushing breathlessly in pursuit, we can build up a really noteworthy effect. Similarly, if in the place of Willie and his message we have some physical destruction rushing along a course which may or may not intersect with Smith's path, we can

Continued on page 34



Photo by Emmett Schoenbaum, A.S.C.

Adventuring on the Kodachrome Trail

by
Henry Fonda

SIXTEEN-MILLIMETER filming is teaching me the real why and wherefore of professional movie-making. After having acted in several important productions, I'd begun to feel that I knew a little something, at least, about making motion pictures. Then I bought a 16mm camera and went into production for myself. And what a liberal education I've been getting! Things that seemed meaningless complications to me before, or had even been entirely overlooked, now turn out to be mighty important details—if you ignore them, your picture develops an aroma of fine old limburger on the screen!

My discovery of 16mm came just as I was cast to play in "The Trail of the Lonesome Pine." Ever since I came to Hollywood, I'd been Leicapicturing my studio experiences; but playing in the first outdoor three-color Technicolor feature just naturally called for color in my personal shooting. Kodachrome movies, of course, supplied the logical answer. I got myself a Simplex camera and some Koda-

chrome film, and set to work. My first idea was to make a silent, Kodachrome version of the picture: but on a feature like that, they shoot well over 200,000 feet of film which, translated into 16mm with all economy, would have had me exposing something on the more expensive side of fifty thousand feet of Kodachrome—which would be just too bad! After a few days of energetic shooting, trying to keep up with the Technicolor camera, I decided I'd better trim my plans down to something nearer my size.

But it had to be a regular production; I'd suffered through too many miles of random, animated snapshots to be interested in haphazard filming, even in color. So three of my pals and I are concocting a burlesque "Western." We're taking all the old clichés, all the tried and true hokum, and burlesquing them within an inch of their lives. It's lots of fun—but plenty instructive, too. Best of all, if we can finish the picture as well as we've started it, I don't think it will be one of those films that sends polite home audiences to sleep!

The purely photographic side of the job is easy enough. I simply use my Weston exposure-meter religiously—and that's that. Incidentally, I've found it mighty interesting to ask every other Kodachromer I meet what meter speed-rating he uses: I don't think any two of them have given me the same reply. Personally, I set my meter for a film-speed of 3, and get excellent results. In Kodachrome, as in most color-processes, you can to a considerable extent control the sort of color you get by controlling your exposure. If you want normal colors, try to hit the exposure right on the nose. If you want softer shadings, overexpose. If you want to brighten the colors, underexpose—or rather, cut down on your exposure. You'll be surprised what you can do this way!

I think you're likely to get the best results in Kodachrome if you do your shooting either very early in the morning, or late in the afternoon, when the shadows are long and interesting, and the light mellowly tinted. I've also heard it suggested that during the middle part of the day, you can get warmer effects by using an Aero I filter; I'm going to try it, anyway.

After shooting beside a professional troupe, one of the first things I noticed when I started "on my own" was the absence of reflectors. Don't let anybody tell you they aren't as useful to the amateur as to the professional! When you're shooting people with hats on, for instance, reflectors represent the difference between inky shadows—and faces that mean something. Especially in color! If you asked me to list the most useful accessories in Kodachrome filming, I'd put reflectors along with exposure-meter and tripod as indispensable.

One of the first funny things I noticed when I started to work in the studios was that every now and then the director (any director) would suddenly close his eyes, and make funny pointing movements in the air with his fingers, stabbing away to right or left like a candidate for a padded cell. Finally one day I broke down and asked a director what was the big idea. "That," he said, "is just on attempt to keep myself straight on whether to have an actor's look 'camera right' or 'camera left,' so they'll match up with the other scenes." That didn't make any particular impression on me—until I projected the first sequence of my own 16mm production. I'd gotten crossed up on that very point—and ran into retakes on my first day's work! I had people who should have been facing each other, talking violently into the backs of each other's necks. Doesn't sound possible, does it? But it is: you've got to remember

Continued on page 36



Two Photofloods made this: one in the reading-lamp by the bed; the other in a desk-lamp on a chiffonier just out of the picture at the left.

Lighting with Common-Sense

by
Walter Blanchard

A NUMBER of years ago, I climbed a mountain. I struggled up its rocky face, hanging on by toes, teeth and eyebrows, until at last I reached the top—and found a lovely, smooth pathway by which I might have ascended, without nearly so much trouble and so many bruised shins.

Interior lighting is a good deal like that mountain. You can make no end of work out of it—or you can use a little common-sense, and get there much easier. After all, why is interior lighting—is it to enable us to show off our technique, or to enable us to make pictures? If you say yes to the latter question, I'll ask another: why make pictures? My answer is, to show somebody doing something interesting and natural.

Now if we're trying to show someone doing something interesting and natural, there's no earthly sense in making the job either an ordeal, or a field-day for lighting trick-

ery. The main thing is to get a natural effect on the screen—and to Halifax with "light effects!" The really important effect to try for is that of absolute naturalness.

In a long-shot, for instance, the effect of naturalness is to have the room look on the screen just as it usually some, but not all, of the lights should be on: table and does to the eye—without suggesting that someone had set up camera and lights to make pictures. Let's see now—reading-lamps cast pools of light immediately around themselves, but there are plenty of shadows. Lighting such a shot for the camera, you could begin by putting a Photoflood into each of the reading-lamps. Sometimes, this will be enough, again, you may find it a good idea to slip a fairly high-powered bulb into the wall fixtures. Where the fixture is in the picture, a 75-Watt globe is usually enough, and using the inside-frosted type, on modern films, you won't have trouble with halation. In other fixtures, chandeliers, and so on, out of the camera's range, you can use Photofloods to add to the general illumination.

Generally, there is some definite point which you want to make the center of attention. The best way to do this is by making it the most brilliantly illuminated part of the picture. If you can't do this with the room's regular table and reading lamps, reinforced with Photofloods, this is the spot to light with your regular photographic lights. And—aside from this one area, don't be afraid of shadows; they simply add to the natural effect!

In closer shots, the problem is different: we still want the natural effect, but we want to add to it a pleasing presentation of whoever is shown in the shot. This introduces the matters of portrait-lighting and posing; but treated sensibly, they needn't be complications. A combination of a single Photoflood in a natural unit, such as a reading lamp, with a couple of regular photographic lighting units, should be quite enough to take care of the matter of illumination.

The first thing in any portrait lighting is balance—not the featureless, flat balance we get when both sides of the subject are illuminated equally, but the pleasing balance we get when one side is lit just a little more strongly, and the other is moulded with soft shadows. The elementary rule for this, of course, is to have two lights, one on each side of the camera, with one of them a little nearer to the subject than the other. It is important to balance the two sides carefully, so that the highlight side is not "burned up," while the shadowed side remains softly shaded—not a harsh, black shadow. Hard, sharp contrasts kill the natural effect.

In close-ups, the important part of the picture is the actor's face: it must dominate all the rest of the scene, and it must be shown to its best advantage. No two faces are alike, so no blanket rule can be laid down for lighting them. Study each face as an individual picture. Invariably, there will be some particular angle which is the best—some feature which is the best, and almost always, some less attractive ones which should be subdued. Ordinary common-sense tells us we should make the most of the good features, and try to minimize the poor ones.

For example, some people, if the light comes too much from the sides, tend to look "baggy" around the eyes. This can be corrected by having the light come more flatly from the front.

Everyone, too, has a "best" side of the face; naturally

Continued on page 39



New Year's Revolution-- A Comedy Continuity

by
J. Dickinson Reed

SCENE 1. LONG-SHOT of a Church with a number of cars parked in front.

Scene 2. MEDIUM LONG-SHOT of door of Sunday-school rooms. The children come trooping out, and go to the cars in which their parents wait.

Scene 3. MEDIUM-SHOT of Billy Smith: the camera follows him as he goes to his mother's car, gets in and drives off.

Scene 4. LONG-SHOT from the Smith porch: the car drives up, and Mrs. Smith and Billy come into the house. FADE OUT.

Scene 5. FADE IN. LONG-SHOT in the Smith living-room. Mr. Smith is comfortably seated in an armchair, reading the paper. He looks up as Mrs. Smith and Billy come in.

Scene 6. TWO-SHOT: Mrs. Smith and Billy sit down, and Billy leans forward, talking earnestly.

Scene 7. CLOSE-UP of Billy, talking.

TITLE: "... an' teacher said everybody ought to make resolutions to get over his bad habits in the new year..."

Scene 8. Same as Scene 7. WIPE OFF.

Scene 9. WIPE ON: MEDIUM-SHOT of Billy at a desk. He has just finished writing something. He takes it, and gets up.

Scene 10. TWO-SHOT: Billy drops onto the arm of his father's chair, and shows him what he has just written.

INSERT: "Roll-up" shot of the paper, which reads:

New yerese rezulooshuns of the Smith Fammly:

Mr. W. Smith rezolvs to give up smooking, keap-ing the funny paper and sponking Billy.

Mother rezolvs to give up gosipping and feeding us spinnich.

Billy Smith rezolvs to fold his napkin and be more considerick of mamo and pappo. And to quit fiteing.

Sined —

Scene 11. LONG-SHOT of the family group around the desk. Each in turn sits down and signs the paper.

Scene 12. CLOSE-UP of a finger pressing the doorbell button.

Scene 13. Same as Scene 12. Mother leaves to answer doorbell.

Scene 14. LONG-SHOT toward doorway of living-room, Billy and his father in foreground. Mother enters, with a telegram in her hand. She seems excited.

TITLE: "It's from Grandma—she's going to visit us next week!"

Scene 15. Same as Scene 14, but very short. FADE OUT.

Scene 16. FADE IN: CLOSE-UP of calendar, with a January, 1936, date; if it is an ordinary calendar, have one date circled in red, with the previous days crossed off; if it is a one day to the sheet calendar, have a hand tear off a leaf. WIPE OFF.

Scene 17. WIPE ON: LONG-SHOT in front of house. The car drives up, and the three Smiths get out, escorting Grandma into the house. FADE OUT.

Scene 18. FADE IN. LONG-SHOT in the living-room. The family come in from dinner.

Scene 19. TWO-SHOT of Mr. Smith and Grandma. She presents him with a box of cigars. He pantomimes that he doesn't use them any more. She shows surprise.

Scene 20. MEDIUM-SHOT. Mr. Smith is about to sit down in his chair. Billy comes in with his father's slippers and smoking-jacket, and helps Smith Sr. into them.

Scene 21. CLOSE-UP of Grandmother, showing surprise.

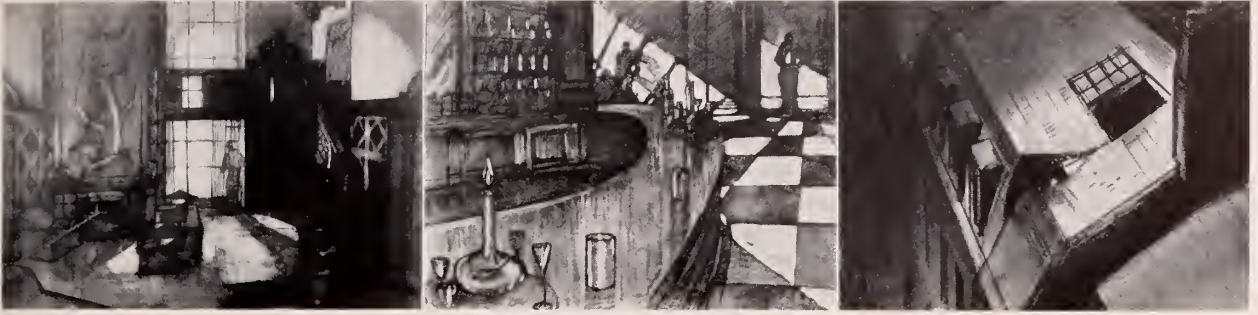
Scene 22. MEDIUM LONG-SHOT. Mr. Smith sinks into his chair, picks up the paper, and carefully takes out the funny-section, which he gives to Billy, who thanks him politely.

Scene 23. TWO-SHOT. Grandmother takes a pair of boxing-gloves from a box, and presents them to Billy. Billy shakes his head, indicating he doesn't fight.

Scene 24. CLOSE-UP of Grandmother, still more surprised.

Scene 25. TWO-SHOT of Mrs. Smith in a chair; Grandmother draws another chair up close, and leans forward confidentially.

Continued on page 38



Harmony in Texture and Design

IN GOOD DESIGN we have many things that must be considered. As harmony is the final basis of good design we must consider the relations of all things used in composition as a whole. First we must have harmony in texture, such as wood, textiles, metals, potteries, and all made objects that have a quality known as texture which is fundamental in the idea of harmony between objects which are used together. If we were to use together, all things of the same texture, the result would be a monotonous textile composition. Textures should harmonize with the structural figure, and all stiff glossy fabrics emphasize the angular and stout figure, while soft dull materials soften the line of all figures.

Rough materials absorb light rays and blend, while glossy surfaces reflect light rays and are less capable of blending colors, thus showing a direct increase in size. When two or more textures are used together, one should predominate, the others become the subordinate or enriching aids.

Natural beauty of colorful material should enhance with the addition of design, never minimized or decreased. If a design does not enhance the material or article, it has no reason for being. If textural quality or color is sufficiently rich, do not hesitate to use it alone.

Textures of different materials reveal an interesting vibration or rhythm of color, as in interior decoration the stippled wall, carved stone, polished metals, or the friezes; shiny materials or surfaces reflect light or color to the eye while soft materials break up and result in a gradation of color. The beauty of certain textiles like satin, resides very largely in the fact that light, as it plays upon it produces a natural gradation of values. A yellow satin registers in its folds not only a rhythmic movement of values and intensities but even of hues, playing through the yellow-orange to orange and even to the blue side of the spectrum.

by

J. Belmar Hall,

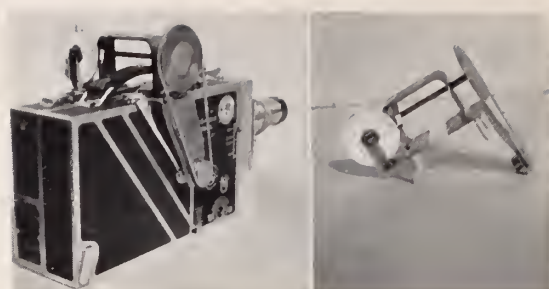
Instructor, Department of Cinema, U.S.C.

In structural design we have textures, which we call MASS; (soft), paper, cloth wood and stone; the accents to these are, hardwood, marble, metal, which are all glassy surfaces and are used to accent or embellish the design. In textiles we have lace, velvet and wool, which are the soft textures; satin, or sateen, the accents, with jewelry used for contrast; and bric-a-brac the enrichment note. Each has its place in design and must be used in relation to its proper proportion, then we are bound to have harmony. Harmony of texture is dependent upon the judgment of appearance of different materials used together or through the sense of touch of combinations of materials.

Design must have rhythmic movement, which we call dynamic symmetry and in the last analysis, is purely a matter of space relations, subdivisions, and as such is all composed of mathematical relations. If these relations are orderly, based on some law or laws, it makes for beauty, or whatever name one may give to a thing, which Di Vince called, "A marvelous necessity." The illustrations, 1, 2 and 3 are based on this principle; using the root two rectangle. Each interesting line that crosses is called the eye, and if we study these "eyes" we will find that they are the stopping point of some important line action. Dynamic symmetry is the natural law of all composition, because if we examine any thing in nature we will find that it follows this

Continued on page 37





Wipe-off Title

by
R. Y. Buerger

THE BASIS of this gadget is the works from an electrical clock, plus, of course, the regular titling stand.

The electric clock as you know is based on the cycles and gives a complete revolution every minute. With these known figures it is simple to time the wipe-off arrangement.

The gadget was built around an Eastman titler. A black box was made to fit this titler. On top of the box the electric clock motor was placed. The shaft of the motor extends through the box and connects with the title-holder by means of a spring clip. There are two frames on the holder; one in the center to make a wipe-on and wipe-off or swirl which will take approximately 30 seconds. The reason it takes only 30 seconds is because it is not necessary to make a complete revolution of the wipe-off blade, but only a half revolution to obtain the effect.

The other frame with the white card is used for quarter turn, or wipe-on and stop or from a still to a wipe-off which takes about 15 seconds.

The box can be set on end to make a turn-up title or a turn-down title. I use the Eastman titler with the title-holder frame turned down to clear the title-holder in the box as you can see from the illustration above has to turn.

If you realize that an electric clock makes one complete revolution a minute, you can readily understand how its works can be adapted to a gadget of this kind. Some more handy gadgeteers may find a method for making barn-door wipes, etc., with this contrivance. However, it is a fine suggestion for experimenting.

Footage Indicator

by
L. McKinney

THIS FOOTAGE INDICATOR built for an Eastman Special 16mm camera, could with modifications be applied to most any other make of camera.

The indicator consists of a brass dial, painted white and graduated in feet and frames, mounted on a shaft together with a small bevel gear.

The assembly is mounted in supports at right angles to a main shaft upon which is mounted another gear, meshing with the first mentioned gear and a brass disc grooved to take a coiled wire belt.

The main shaft support is mounted on a brass plate base with prongs on the underside to hold indicator in place on the camera. On one end of the base a brass strip extends down to the shaft carrying the winding crank and at the point in line with the winding shaft a short shaft is mounted having only one bearing. At the end of this short shaft next to the camera is a collar with a square hole in it, which fits over the square projection of the camera winding shaft. At the other end of this shaft and on the other side of the brass strip supporting the shaft is a small brass disc grooved for the belt.

The ratio of RPM between the graduated dial and the camera winding shaft is 1 to 5 and there is therefore 5 feet of film per revolution of the dial.

An index mounted at the edge of the dial and a coil wire belt complete the indicator. The indicator is very easily slipped on and off the camera and can readily be reset to zero without removal.

The advantage of this indicator over the one built into the camera is that it is easier to read, can be read closer and can easily be read while sighting through the viewfinder and it is therefore extremely useful in all double exposure work.

Just What Is "Montage" Anyway?

WHAT IS "MONTAGE"?

When asked, one receives as many different replies as there are people to whom the question was broached.

A cutter will tell you that it is nothing else but a French word, the translation of which means "mounting," by which the art of film-editing is meant. He goes out from the viewpoint that the word was invented by someone who wished to awe the world.

To a cameraman the word "montage" means little more than angle-shots; the screwier the angle the better the "montage."

A director will stare for a moment in the beyond when bothered by the asker, and, describing a vague gesture in the air with a hand, he will reply that "montage" is something . . . , something that some pictures possess and others lack.

And to an actor it is just "nuts."

To a set-designer it embodies the amount of outstanding sets the picture boasts.

The special-effects department will tell you gleefully that when a picture is devoid of "tricks" it lacks in "montage."

From the production-department the questioner merely receives a cold store.

And the question remains unanswered. Everyone is treating the question from a personal viewpoint and endows the answer likewise, never giving it another thought or a faint suggestion of an attempt to explain it purely from a motion-picture viewpoint.

In framing an explaining answer to this all-important question one must have at his command a complete and detailed understanding of the motion-picture laws, as otherwise one is at a loss to fully explain the intricacies and purposes of "montage," and therefore unable to apply it intelligently and to its fullest scope to the betterment of the motion-picture, endowing it with a much greater power than would be possible any other way, for "montage" is built on the power of suggestion.

What is "montage"?

MONTAGE IS A COMPOSITION OF STRIPS OF FILM, WHICH IN THEIR COMBINATION AND ARRANGEMENT TO ONE ANOTHER CONVEY TO THE AUDIENCE A (SUGGESTED) IDEA OR EMOTION; BUT LACK THIS ABILITY WHEN TORN APART AND PROJECTED SEPARATELY.

In analyzing this answer our attention is called immediately to the power we have here at our command, a power so great that it is liable to boomerang when used inexpertly inasmuch as we are able to bring over an idea or emotion to the audience merely by the use of simple strips of film which are utterly lacking in themselves in bringing over anything at all; in other words: strips of film which in themselves, and when projected singly, are absolutely meaningless. It stands to reason that when these meaningless strips of film are composed and arranged in a faulty way they either will not achieve their power, or achieve it in such a way that they convey an entirely different idea than what is demanded, thereby throwing an entirely different light on the development and progress of the story that the film is telling, and in such a way are able to make the audience laugh where it should cry, or vice versa.

by
Max Liezt

Inasmuch as these meaningless strips of film only achieve their ability to bring over an idea when set in their proper arrangement to one another it is of the utmost importance that the "arranger" must be a person who has a profound understanding of the motion picture laws as otherwise more havoc than good will be achieved and the picture, as projected in the theater, will fall flat.

Knowing what "montage" is able to do, it is imperative that we answer the question: When should "montage" be used?

"Montage" should, and must, be used wherever there is danger of the audience getting ahead of the story. Inasmuch as we are able with "montage" to convey an idea within the space of a few seconds, without "montage" it would take us minutes to bring over a point that is becoming familiar to the audience in seconds by means of their speedy deduction from the previous scenes, and on account of the speed of the mind the audience would be familiar with this particular point in the story long before the film would have scored it, creating in the mind the statement: "The picture is draggy!", and cause the audience to lose interest in the picture.

"Montage" is especially of great value to us when it is used in defining or building of a character in the picture. By this process we can in a few seconds tell the audience everything about a character that it needs to know for motivation of its actions later on, without thereby interfering with the steady unfoldment of the story.

To illustrate the tremendous power of suggestion in "montage" I shall cite an example whereby we shall make use of only three meaningless strips of film, utilizing two of these to create two entirely different and opposing emotions in the third one.

These strips of film are: a shot of a tiger, a shot of a kitten, and a close-up of a man's expressionless face. When projected singly each of these film-strips is meaningless as to idea or emotion.

However, by connecting the blank face with the kitten we suddenly find ourselves reading a tender expression into the man's face.

Now we connect the same blank face with the film-strip of the tiger and we find ourselves reading cruelty into the man's face.

But both times it has been the same strip of film with the same expressionless face, but on account of "montage" with two other meaningless strips of film we were able to create two distinctly different emotions (ideas) in the audience's mind.

When "montage" is understood intimately and employed intelligently, the picture in which it is utilized gains all around.



WHEELS OF INDUSTRY

Eastman Magazine Cine-Kodak

● Eastman Kodak Company has produced a new 16mm Cine-Kodak loading with a magazine and having other features further simplifying the taking of motion pictures by the amateur and at the same time providing him with increased versatility of operation.

In addition to the use of a magazine, thereby eliminating the operation of threading the film, the new camera has three speeds, interchangeable lenses, a device that prevents accidental exposure while the camera is not in use, an automatic shut-off for the spring motor, and an ingenious device described as a "pulse" for timing the length of scenes.

Appropriately named "Magazine Cine-Kodak," it can be loaded in three seconds, merely by opening the hinged cover of the camera, as if it were a book, slipping the magazine inside and closing the cover, without having to adjust a single thing inside the camera or on the magazine. Sliding a finger tab on the top of the camera releases the cover for opening and locks it when closed. A further slide of the tab sets the mechanism for operation. Until this is done, the mechanism remains locked and there can be no accidental exposure.

Another eminent advantage is the ability to exchange partly used film for another type without having to run the entire footage to do so. Thus, to switch from Panchromatic to Super-Sensitive "Pan" for indoor pictures or to Kodachrome for color "movies," it is only necessary to remove the partly used magazine and replace it with a magazine loaded with the film desired. A magazine can be removed without the necessity of wasting a single frame of film because of a protecting slide which is moved over the film aperture of the magazine by the same operation that unlocks the cover of the camera. One may have any number of partly used magazines which may be returned to the camera to complete the exposure. The magazine protects the film. A footage meter on each magazine shows how much film has been used, whether in or out of the camera. The dial may be plainly seen through a shutter-proof window in the camera cover.

The Magazine Cine-Kodak also gives

the amateur increased versatility in speeds. There are three of them—normal, half speed and slow motion—controlled by a lever located beneath the built-in exposure guide on the front of the camera and marked "8," "16" and "64."

The new and intriguing device called a "pulse" is located in the side of the camera—a tiny button over which the finger is placed and which "beats" every half foot, or 20 frames, while the film is being run. This is of great convenience in timing the length of a scene.

With the Magazine Cine-Kodak are supplied the same accessory lenses available for Cine-Kodak K and Cine-Kodak Special—the 2-inch f.3.5 and the 3-, 4½-, and 6-inch f.4.5 telephoto. There is an inexpensive adapter which fits them to the camera by a simplified method. To make a change to any one of the four, the standard f.1.9 lens is removed merely by pressing a button, and turning the lens. The adapter fits as easily in its place. Then the other lens is fitted on by sliding a lug on the lens into a slot in the adapter; the rotating collar is given a turn or two, and the lens is set in positive, taking position.

In focusing, guess work and squinting are taken out by the full-vision eyepiece finder system, which competently serves all lenses. The front view finder has two elements. Together, they show the field of the standard f.1.9 lens. By sliding the rear element backwards along a track it "clicks" into a notch identified by an arrow as the position for use with the 2-inch lens. Another move backward and it further narrows the field as it slides to the position for the 3-inch lens. Again in the same

way for the 4½- and 6-inch telephotos.

Two other salient features of this camera are the secured winding crank, which swings back into a notch in the case when not in use, and an automatic shut-off for the spring motor, which insures against over-exposure when the motor is in need of winding. All in all, Magazine Cine-Kodak constitutes a notable advance by Eastman in the further simplification of home "movie" making.

New Kodachrome Processing Station

● Eastman Kodak Company has opened another completed Kodachrome processing depot at Chicago. There are now three such stations in the United States, the two others being located at Rochester and Los Angeles. The address of the Chicago station is 1727 Indiana Avenue.

New Agfa Processing Station

● In order to give faster service to the users of Agfa 16mm reversible film in Northern California and the northwestern states, Agfa Ansco has appointed the Motion Picture Service Company, 125 Hyde Street, San Francisco, Cal., as an authorized Agfa Ansco 16mm finishing laboratory. This new 16mm finishing laboratory has installed complete new and modern equipment for the processing of 16mm reversible film and is now ready for operation under the supervision of a trained Agfa 16mm technician. Agfa 16mm reversible films sent to the Motion Picture Service Company will be finished promptly and returned to the sender without charge.

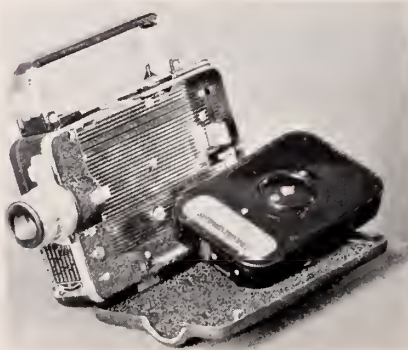
Authorized Agfa Ansco 16mm reversible film laboratories are now located in New York City, Chicago, Kansas City, Los Angeles, San Francisco and Montreal.

Rolleiflex Exhibit

● Alajos Schuszler, who won the first prize with his picture of a team of horses at a watering fountain—at the Rolleiflex Exhibition and Salon—held at the showrooms of Burleigh Brooks last Spring, will hold a one-man exhibition consisting solely of photographs made with a Rolleiflex camera—from December 26th to January 11th.

This exhibition will take place at the

Continued on page 39





New versatility from new accessories

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New accessories: An Optical Finder for the exact determination of the fields of all lenses at all distances, Electric Motor Drive with speeds from 1 to 64 frames per second, Reflex Finder Image Magnifier for split-hair focusing, Lens Extension Tube Outfit for filming objects as small as .047 inches in width, and a new telephoto lens set-up of many decided advantages.

free — The whole story is to be found in the Ciné-Kodak Special Presentation Book, yours upon request. Eastman Kodak Company, Rochester, N. Y.



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News of the Clubs**Chicago Club**

● The Chicago Cinema Club must be gluttons for punishment. Their latest bulletin indicates one meeting a week is not enough; extra meetings will soon be held on Monday nights in addition to Thursday night. Why don't they run double features like the regular theatres and pack it into one night? However, congratulations, that's what might be termed real incurable omoteurs.

Los Angeles Elects

● In its December meeting the Los Angeles Cinema Club elected a new staff of officers. Franklin B. Skeele was given the post of president. Skeele was secretary several years ago. Mr. Grom was elected as secretary and treasurer, while Dr. Leroy Boiley, the former secretary, was made vice-president.

At the meeting the winners of the

annual prizes were announced. Dr. Linek won first prize with his 8mm picture of the "San Diego Fair." C. E. Memory won second prize with a documentary picture called "Pacific Highways." President-elect Skeele was also among the winners with his vacation picture titled "Hook, Line and Sink."

Los Angeles 8mm Club

● The Los Angeles 8mm Club elected new officers at its annual banquet meeting. Dr. Henry A. Linek was made president, Mr. G. Word was elected secretary and treasurer and Mr. E. Jando, vice-president.

At this meeting winners of the annual prizes were announced. The first prize went to Dr. Lascher for his picture "Red Cloud Rides Again;" the second prize to Claude Cardorette for his picture "Conscience," and the third to R. B. Clardy for "Fisherman's Harbor."

This Matter of Tempo

Continued from page 25

by the same method build up to a high state of suspense: will he get out of the way in time, or will he tumble unsuspectingly into the path of the rushing danger?

Another place where we meet old movie tempo is in camera-angles and the positioning of the players. Oh, yes, and we can make him work for us in a surprising variety of ways. Generally speaking, the larger an object is in the picture or, to put it differently, the closer it is to the camera, the faster it seems to move. For instance, if we make an extreme long-shot of a train—even the latest streamline speedster—it rarely gives much of an impression of speed. If we come closer, so that the train fills more of the screen area, the apparent movement speeds up appreciably; and if we make a real close-up of the train—even a dyspeptic freight—our audience gets the impression of roaring, break-neck speed. If you saw the professional film "Silver Streak," you may have noticed this fact. In it was a long sequence in which the celebrated Burlington "Zephyr" apparently ran wild; it was supposed to furnish one of the big thrills of the picture—but it fell flat because the director chose to play it largely in long-shots which gave no impression of speed. Only in the extremely few closer shots did you have any feeling that the train was really rocketing along at a hundred-mile clip.

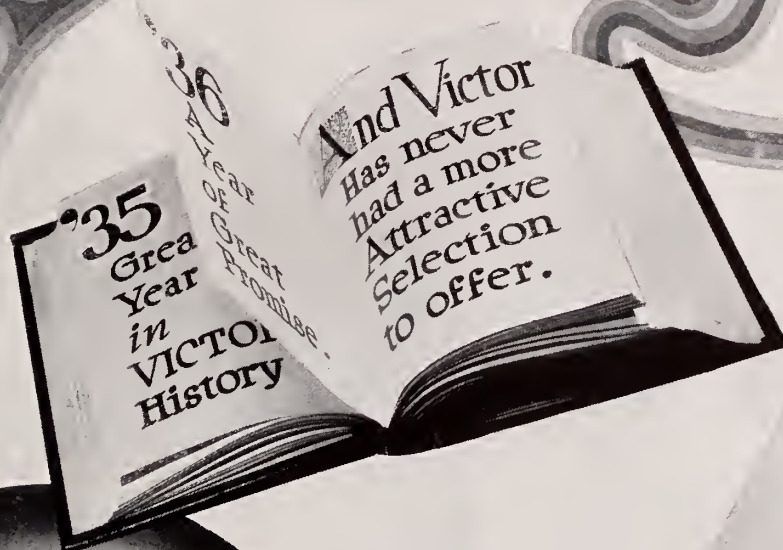
This same rule holds good no matter

what the action is: our subject may be a racing car, an airplane, the "Normandie"—or the kiddies playing in the back yard. Always, the commanding position is that nearest the camera.

An important contributing factor in this, of course, is the fact that in showing swift-moving action in close shots, most subjects get into and out of the picture very quickly, so that the scene occupies only a few split-seconds of screen time. Obviously, then, you can do a lot to pep up a logging tempo by cutting down on the length of your scenes. Generalizing once more, if we want to set a slow, placid tempo, we should use long-shots, and allow them plenty of footage; and we should have relatively few cuts from one shot to another. On the other hand, if we want a fast tempo, we should use closer shots, clipping them short, and using more of them, to give variety and zip to the sequence. A wisely selected assortment of different camera-angles on the action can help, too. But here's another thing to remember: if your scenes are short, and your action fast-moving, choose angles that are easily understood. Save the intricate, "arty" angles for slower-paced sequences. Let's say the average 16mm scene is five feet long: that gives the audience ten seconds to see it and grasp its meaning before the next shot comes along. If we're setting a fast tempo with close, short-trimmed shots, this time may be cut down to but one or two seconds—or even less: and if

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the way the camera shows the action to
 the audience isn't simple and quickly
 understood, the shot will be gone before
 the viewer has a chance to figure out
 what he's looking at.

Using these last two tempo-builders—
 close angles and quick cutting—it is easy
 to build up to a fast tempo from a slow
 start. You can begin with long-shots,
 cut fairly long, and work progressively
 closer and shorter, until you have things
 moving to a climax comparable to a
 Russian Montage sequence. On the

other hand, since a fast tempo such as
 this usually builds to a really important
 climax, it's not often advisable to at-
 tempt the reverse of this trick when you
 have to slow down, though a skillful
 cineaste can do it. Much better, as a
 rule, to use a very slow transition like
 a slow fadeout followed by a deliberate
 fade-in. This breaks the chain of
 thought definitely (which you usually
 want to do) and by its slow-paced
 bridging over to the next sequence, paves
 the way for a more deliberate tempo to
 follow.

Adventuring on the Kodachrome Trail

Continued from page 26

that the camera represents the eye of
 the audience, which will see the various
 scenes in relation to each other. So
 if you want things to look right on the
 screen, you've got to direct your scenes
 so that, when they are cut together,
 every angle and action will fit in prop-
 erly with the impression established by
 those already shown. Often this will
 entail shooting things in a way that, at
 the time, seems absolutely wrong, but
 which if you'll only stop to visualize your
 whole sequence as a projected picture,
 will prove to be right on the screen.

Another tricky matter is that of exits
 and entrances. If I show a fellow leav-
 ing a scene "camera right," I must show
 him entering his next scene from "cam-
 era left." The first scene establishes
 a direction for his movement in the au-
 dience's mind, and if he reverses it in
 succeeding shots (without being shown
 doing something which would account
 for the change) the audience will be
 confused, and feel that something
 screwy has happened. By the same tok-
 en, in "chase" sequences, this matter
 of continuity of movement is doggedly
 important. Suppose, for instance, that
 I show Jim Stewart leaving one scene
 with a posse at his heels. He leaves
 the scene heading "camera right": well,
 he's got to enter each succeeding scene
 from "camera left" until he escapes or
 gets caught—unless I very clearly show
 him doubling on his tracks; then he
 would just as naturally have to carry on
 his movements from right to left. The
 posse, too, must leave the first scene
 going "camera right," and enter suc-
 ceeding ones from the left. On the
 other hand, if Jim and the posse are
 going in opposite directions—either away
 from each other, or approaching each
 other—one must always move across
 the screen in one direction, and the
 other in the opposite direction. It
 darn near breaks your heart keep-
 ing these things straight, for you'll
 be doing things that are abso-
 lutely illogical in real life, and you'll

often have to forego shots that would
 be highly effective individually if shot
 some other way—but the real effect is
 what shows up on the screen. Similarly,
 if you want straight angles on such
 scenes, remember that the person being
 chased should be shown going away from
 the camera, and the pursuers always
 coming toward the camera.

We've had a lot of fun kidding the
 styles of some of the professional movie-
 makers. For instance, there is one com-
 pany which almost always begins its
 pictures by a succession of close shots
 of the principal players—just by way of
 introduction. We're doing the same
 thing, with variations. For the past
 month, we've grabbed a close-up of
 every Tom, Dick and Harry that came
 near the house—the postman, the ice-
 man, the milkman, the grocer's boy,
 and everyone else. We'll open the pic-
 ture with an endless succession of these
 close-ups—and then ignore the people
 shown! Another tradition we're dese-
 crating is the business of "reactions"—
 you know, "A" shoots "B," and at the
 shot, you are shown "flashes" of a doz-
 en other characters reacting to the
 sound. We're shooting each of our re-
 actions three times, each "take" being
 identical with its companions. So
 when, in one sequence, we show a fel-
 low reacting to the sound of a shot
 by suddenly stopping, lathering his face
 and looking up, we'll also use the same
 reaction for anything else he's supposed
 to react to—even if the action of the
 later business may be at midnight, or
 what he's to react to is entirely differ-
 ent.

In one sequence, we've essayed a dual
 role. Jim Stewart, dressed as a cowboy,
 climbs up onto the roof of the house,
 and carefully scans the horizon. In the
 distance he sees—Jim Stewart, in a
 different costume, approaching. The sec-
 ond Jim Stewart glides through the
 bushes, watching Jim No. 1. The Jim
 on the housetop reaches for his gun; the
 lower Jim pulls out a huge cap-pistol

(obviously a cap-pistol, as proven by a close-up), and fires. Jim-on-the-roof is hit, and starts to fall. Then we show three short "flashes" of him falling—Eu; they are identical "flashes!"—a flock of assorted reactions from innocent bystanders, and finally the defunct Jim plops onto the ground, as though he had fallen from a tremendous height. A tremendous flow of gory red blood (actually beet-juice, but in Kodachrome it makes swell blood) gushes from his mouth. Jim-on-the-ground comes over, looks at the remains, and proceeds to kick his own corpse in the face! How was that done? Just a matter of cutting: close shot of the corpse, long-shot of Jim approaching the camera, close-up of him looking down scornfully, close-up of his "remains" on the ground, with a pair of legs in the background (Jim's trousers and shoes, occupied by someone else), and the kick itself. On the screen, you'd swear Jim had kicked himself!

And we've struck a knockout of an idea for our opening title. We're going to give the opus a very melodramatic name—something like "Hearts Aflame," or the like. For our opening title, we're going to stretch a generous roll of cotton just below the lower camera-line. After dousing the cotton with lighter-fluid, to make it burn hotter, we'll sprinkle on a copper oxide powder one of the studio prop-men told me about, so that the flames will be spectacularly colored red and green. We'll open the title on these flames; then we'll lower a sheet of tissue paper, into which the title-lettering is cut like a stencil, between the flames and the camera. After we've made enough footage of the flaming letters, we'll set fire to the tissue, and let the title burn itself away from the bottom up. At least, we'll start the picture off with a real "hot" title!

Harmony in Texture and Design


Continued from page 29

low and no matter how the elements in nature may force some growth into other paths that are not natural to it, it will retain within itself its proper proportion as a whole. The screen proportion is nearly a root two rectangle and since the advent of sound comes nearer to the proper dimensions for perfect composition.

Illustrations 4, 5 and 6 show how the cinematographer paints with light in dynamic relation so as to get the most striking effects. The massing of light and shade is important to good composition so that the tonal qualities of textural surfaces will show to the best advantage. Dramatic lighting creates the mood and holds the spectator's attention throughout the entire sequence

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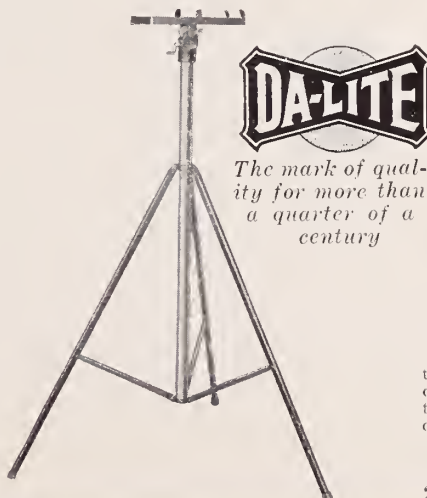
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and it helps build up emotional reactions that the actor could never attain. With the 16mm camera, the cinematographer has to pay more attention to dramatic lighting because his reversal print cannot be doctored in the printing, so any effects must be thought out before shooting the scenes. Don't be afraid to put back-lighting in your scenes, as interiors must show depth, and

it is the back-lighting that gives photographic depth. In the next month's issue I will give some diagrams of lighting for effects. With the super-speed film on the market you can now have a greater range of good photography as I have made some tests with only window light and find by simple masking you can create pictures that are dynamic without the use of many photo-floods.

New Year's Revolution

Continued from page 28

Scene 26. CLOSE-UP of Grandmother talking.

TITLE: "Did you hear about Cousin Hattie's . . . ?"

Scene 27. CLOSE-UP of Mrs. Smith. She assumes a very righteous expression, and shakes her head, indicating "I don't care to know."

Scene 28. CLOSE-UP of Grandmother. She is absolutely flabbergasted.

Scene 29. MEDIUM-SHOT of Grandmother. She sits in her chair, slowly rocking, and obviously trying to understand what has come over the family. Suddenly she shows that she's made a decision, and gets up.

Scene 30. CLOSE-UP of Grandmother, talking excitedly over the telephone. WIPE OFF.

Scene 31. WIPE ON. LONG SHOT (night effect) on a street. A car rushes up, coming toward camera. WIPE OFF.

Scene 32. WIPE ON. LONG-SHOT of house, from across the street (night-effect). The car seen in the previous shot skids to a stop. A man carrying a small bag gets out and hurries to the door. WIPE OFF.

Scene 33. WIPE ON. MEDIUM LONG-SHOT at door (from outside). Grandmother opens it, and hurries the stranger inside. WIPE OFF.

Scene 34. WIPE ON. LONG-SHOT in living-room. The family is standing around in attitudes of surprise, while Grandmother talks excitedly to the stranger.

Scene 35. CLOSE-UP of Grandmother, talking very excitedly.

TITLE: ". . . and, Doctor, they're every one acting so unnaturally I just know something's wrong . . . !"

Scene 36. LONG-SHOT, same as Scene 34. There is a pause as Grandmother stops; then Billy steps forward.

Scene 37. MEDIUM-SHOT of Billy. He steps forward, pointing accusingly, and talks.

TITLE: "Your wife started it, Doc—that prize she offered the class for keeping resolutions. I was gonno get it

an' trade it for some boxin' gloves an' clean up on Tommy Jones!"

Scene 38. LONG-SHOT, same as Scene 34. Everyone relaxes; all laugh except Billy. FADE OUT.

TITLE: THE NEXT EVENING.

Scene 39. FADE IN. LONG-SHOT of the living-room. Mr. Smith is in his chair, reading the paper. Mrs. Smith and Grandmother hove their heads together in the corner talking eagerly.

Scene 40. CLOSE MEDIUM-SHOT of Mr. Smith. His face is hidden behind the paper, on the back of which is obviously the funny sheet. Great clouds of smoke puff up from behind the paper.

Scene 41. TWO-SHOT of Mrs. Smith and Grandmother—obviously gossiping.

Scene 42. MEDIUM LONG-SHOT in doorway. Billy enters; he wears the boxing gloves; his eye is blocked, a tooth missing, and his clothes mussed, but he is obviously happy.

Scene 43. CLOSE-UP of Grandmother. She looks around the room contentedly; obviously she finds everything normal and satisfying. FADE OUT.

THE END.

This continuity will be even more enjoyable to make and show if you adopt the resolutions (and their results) to suit the failings of your particular family. Scenes 30-34 should be made very short, with quick wipes to give a montage effect; it is a good idea to "undercrank" them, shooting them slightly below normal speed—say around 12 frames per second, so the action will be abnormally fast. The night-effects in Scenes 31 and 32 can be made by day, using a red filter (on Pan film) and underexposing. Scene 33 is best made at night, with all the light coming from within the house. All three of these scenes gain in effectiveness if tinted blue.

In Scene 42, Billy's block eye can be created with burnt cork; the apparently missing tooth by a simple application of Max Factor's black tooth enamel, which is made specially for such effects. A few faint traces of the burnt cork on other parts of Billy's face can suggest dirt and bruises, too.

WHEELS OF INDUSTRY

Continued from page 32

showrooms of Burleigh Brooks, 127 West 42 Street, New York, and will consist of about 200 prints, many of which feature diversified and interesting activities and developments which have recently taken place in the public parks of New York City. All of them illustrate the versatility of the Rolleiflex camera and its unique adaptability to varying photographic conditions.

"Ethiopia" in 16mm Film

●The first new single-reel 16mm motion picture subject on Ethiopia, sound-on-film or silent, is announced as available for sale or rental by the Library Division of the Bell & Howell Company. This timely and vitally interesting film portrays the nature of the country and the intimate daily life of the people. The sound narrative, entirely free from forced "wise-cracks," provides an intelligent, fair, and unvarnished presentation of Ethiopian history, population, form of government, economic peculiarities, trades, religions, and many other points of interest.

It is not a transitory "war" film, although thousands of tribesmen, afoot and on horseback, are caught by the camera, and the problems of providing food for a vast army are drastically portrayed. A high spot of the film is the raw-meat-eating ritual of courage, practiced by the army on the eve of its departure for battle, under the watchful eye of the Emperor. The photography, of intense interest and high educational content is by Burton Halmes, world-renowned traveler.

The sound version can be rented. A silent version, with copy of the narrative text supplementing a minimum of titles, will also be available.

B. & H. Sell Printers

●Metro-Goldwyn-Mayer, Paramount, and Columbia Pictures have contracted for the installation of new duplicating equipment known as Automatic Sound and Picture Printers.

These printers were developed in the engineering and research laboratories of the Bell & Howell Company, Chicago, and have been perfected as the result of five years of development.

Both the picture and the sound track are automatically reproduced on these machines at one operation, retaining all of the depth and definition of the original film and without loss of the full range of the recorded sound. As a result, pictures are now being released combining such photographic excellence and faithful sound reproduction that the

most critical audience will be free to enjoy the new films as pure entertainment without making allowances for losses due to imperfect printing.

Unlike the printers formerly used, the new machines are entirely independent of the skill of the operator. Although running at higher speeds, these printers are equipped with interlocking controls and safety devices which make them entirely foolproof. They will stop instantly and automatically in case of film breakage, lamp burn-outs, power-line variations or failure of the air-supply lines which vacuum-clean the film while it is being run. Film waste is thus entirely eliminated.

Lighting With Common-Sense

Continued from page 27

that is the side to present to the camera. John Barrymore's celebrated profile, for instance, was always seen from the left; even in its heyday, his right profile was distinctly unimposing. I have a friend who, from the right, looks strikingly like John Gilbert—while from the left, he suggests an intoxicated owl! Pick your victim's best angle!

Suppose your subject has a thin face, or high, Indianesque cheek bones. These qualities can be subdued by having the light aimed to fall rather low on the cheeks—just below the point of the cheek bone.

Those big, square "captains-of-industry" lower jaws will stand out like a sore thumb if you shoot a full-face angle; but they retire into the background if you keep the subject's head turned slightly to one side or the other. Weak chins—and multiple chins, as well—can be improved by having the subject keep his head tilted up a bit.

Noses can be quite a problem. In the first place, they are likely to cast unpleasant shadows. But these shadows can be eliminated in two ways: first, by having the lamps in a rather high position, so that the shadow falls at a natural (and therefore pleasing) angle—generally coming down to about the corner of the mouth. Or the shadows can be eliminated completely, by lighting very flatly. If a nose is bent, as many are which have been broken and poorly set, you can often hide the bend by shooting from a three-quarter angle, rather than full-face, and outlining the top of the nose with a rather strong high-light from the rear.

Especially with women, the moulding of the jaw must be considered; if the lines

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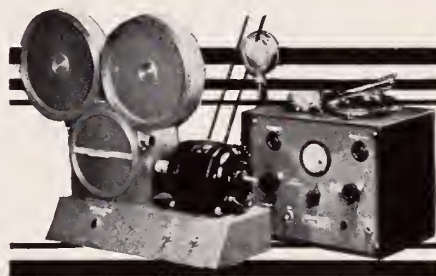
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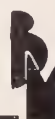


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of the jaw and cheek are to look their best, they should be accentuated with shadows, especially if the throat is bare. The soft shadows prevent the jaw, cheek and throat from merging into one and turning a lovely girl into a chinless wonder. This sort of treatment is especially helpful in photographing those healthy, chubby-cheeked folk whose faces, if you don't watch out, are likely to show up as round as a full moon. Thin, hollow-faced beauties, on the other hand, look best if their faces are lit quite flat.

The eyes, of course, are almost always the really commanding feature. With few exceptions, they need light to help them tell their story. Dark shadows where the eyes should be will kill the best shot. If the eyes are deep-set, hiding under heavy brows, they should be lit from a relatively low angle. On the other hand, protruding eyes should be lit very flatly, so that there are no tiny shadows to tell that the subject has pop-eyes.

Briefly, then, the easy way of lighting is to forget that you are lighting a picture, and to follow the sensible course of trying to make things look natural. Then they'll almost always be pleasing.

1935 Honors

Continued from page 24

ture, "In the Beginning," put forth an idea that permitted him a very wide latitude in the selection of things to photograph. This in itself is very commendable. So many pictures do not have an idea. He based his picture on the Bible, the creation of the world. The music he furnished with it was both inspiring and thrilling. Without music some might consider it somewhat lengthy and should be cut. Unfortunately it could not be presented to the judges with music as it was felt that it would not be fair to the other entrants. It is concluded that good music will help a picture from 50 to 75 per cent in its entertainment value.

We think so well of this picture that we are going to duplicate it for distribution to the clubs with the other prize-winning 8mm pictures of 1935.

"Fishers of the Grand Anse" by Leslie P. Thatcher, showed a splendid sense of documentary value. He kept interest throughout his picture.

The producers of "Chronicle" must be commended for a novel treatment. They employed the hands only to show the life of a boy from his third birthday until maturity. Into this novel treatment they spun a story of the boy's downfall until he is found guilty of murder and is incarcerated. All of it was interior and was well photographed.

Next month we will give you the list of those who were extended honorable mention.

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Amateur Movie Contest



This month's issue gives you the winners of the American Cinematographer 1935 Amateur Movie Contest.

Start thinking about your picture for 1936. The contest will close on November 30th.

This contest will be divided differently again. We will endeavor to give wider recognition . . . that is to offer prizes for more classifications.

Each year presents a different problem . . . it is to solve these problems and in an effort to recognize the serious efforts of the amateur that classifications are changed from time to time.

The rules will be the same as last year. You can enter either 8mm or 16mm film. 35mm film will not be accepted in this contest, nor will reductions from 35mm film be allowed.

CONTEST EDITOR
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The Motion Picture CAMERA Magazine



April, 1936
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HAL MOHR
A. S. C.
See Page 143

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Volume 17 April, 1936 Number 4

What to Read

A NEW Three-Color Process
By Wm. Stull, A.S.C.140

PROBLEMS of Controlling
Photographic Reproduction
By Dr. Herbert Meyer, A.S.C.142

HAL MOHR, A.S.C.
Captures Academy Award.....143

RAPID Processing Methods
By H. Parker and J. I. Crobtree.....144

ABSOLUTE Music By Designed Sound
By V. Solev.....146

Next Month

●Dr. Meyer will write his concluding article on the Problems of Controlling Correct Photographic Reproduction. This has proved a valuable series to those in laboratory work.

●Horry Burdick has prepared for us a fine word description of Joseph August, A.S.C., who has been a part of the motion picture industry for many years. August is now photographing Kotherine Hepburn's latest picture.

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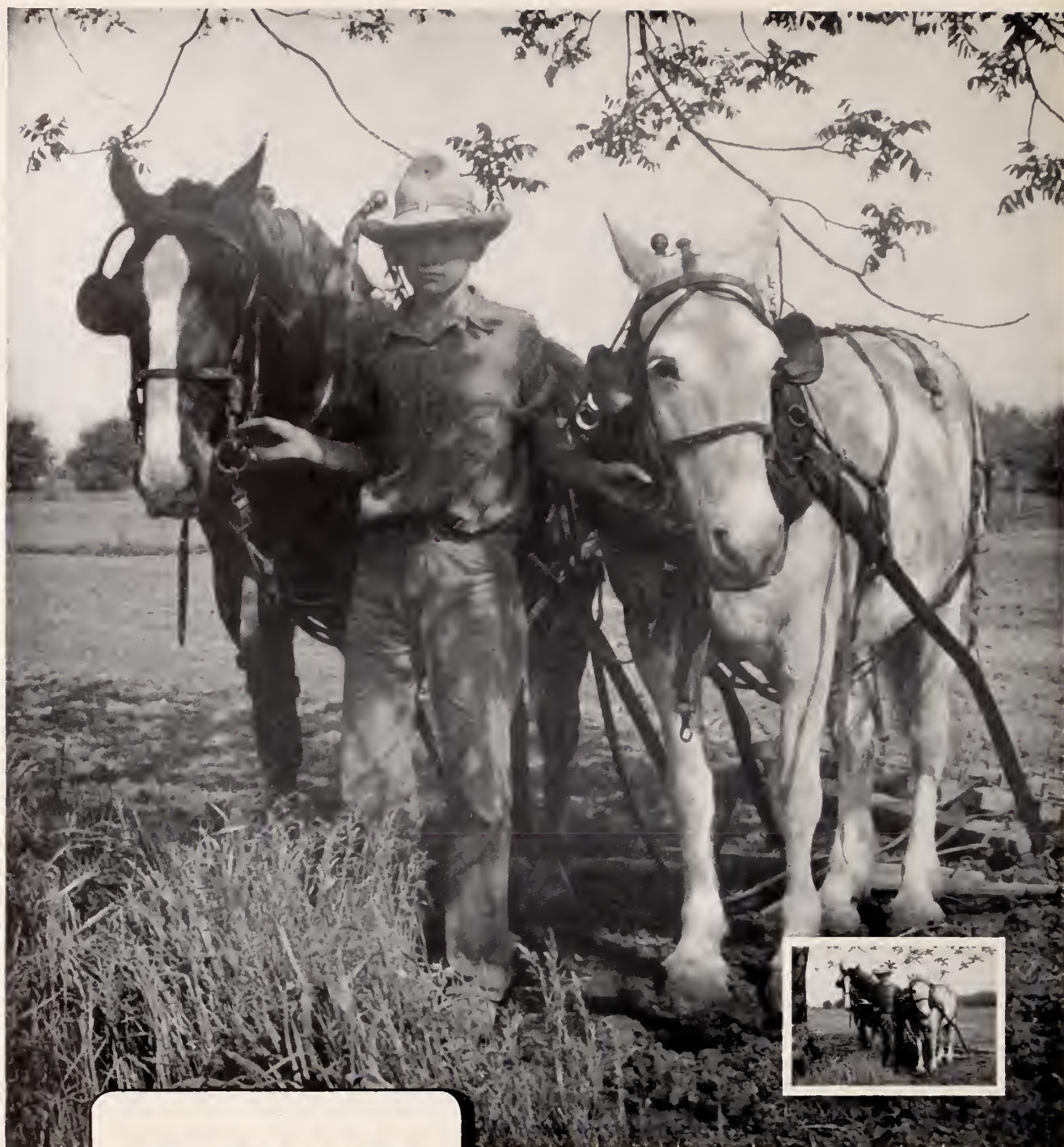
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THE AMERICAN SOCIETY OF CINEMATOGRAPHERS was founded in 1918 for the purpose of bringing into closer confederation and cooperation all those leaders in the cinematographic art and science whose aim is and ever will be to strive for pre-eminence in artistic perfection and technical mastery of this art and science. Its purpose is to further the artistic and scientific advancement of the cinema and its allied crafts through unceasing research and experimentation as well as through bringing the artists and the scientists of cinematography into more intimate fellowship. To this end its membership is composed of the outstanding cinematographers of the world with Associate and Honorary memberships bestowed upon those who, though not active cinematographers are engaged none the less in kindred pursuits, and who have, by their achievements, contributed outstandingly to the progress of cinematography as an Art or as a Science. To further these lofty aims and to fittingly chronicle the progress of cinematography, the Society's publication, *The American Cinematographer*, is dedicated.

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Enlargement from a frame of Keller-Dorian color film.

AT A TIME when public and press are tendering an enthusiastic welcome to good natural-color films, the introduction of a new three-color process of natural-color cinematography, perfected to the point of commercial practicability, must be regarded as more than ordinarily significant. The process in question is the Keller-Dorian Process, an Additive three-color system in which but a single negative passes through the camera, and standard black-and-white cameras with but minor optical modification are used.

The Keller-Dorian process is not a recent development. It originated in Europe a decade and a half ago, and in its 16mm. version (known in this country as "Kodacolor") has been used by numbers of 16mm. enthusiasts. The task of adapting the process to professional requirements has been carried on for some years by the joint researches of the Eastman Kodak Co., Paramount Productions, and the Keller-Dorian Company. During the last year, these activities have been transferred to Paramount's Hollywood studio, where under the joint guidance of Dr. J. G. Capstaff, Dr. N. M. La Parte, and Farciat Edouart, A.S.C., the process has been proved practical under actual studio conditions.

It may be well, before discussing the details of the process, to review briefly the principles underlying not only this, but all methods of natural-color photography. Medical science shows that the human eye has three sets of color-sensitive nerve-fibrils; when all three are excited equally, we get the impression of white; when but one is excited, we get the impression of whatever color that nerve is sensitive to—red, blue or green. When two or more of the nerves are excited unequally, we get the impression of a corresponding mixture of the primary colors. Thus, if we can divide a scene into three photographs, filtered so that each represents one of the primary colors, when we recombine the prints of our three pictures (each colored or filtered by its proper primary), we can achieve a perfect photographic reproduction of the scene in its natural colors.

It is possible to get a partial result by using only two of the three primaries—usually red and either blue or blue-green. But leaving out one of the three essential primaries, it is impossible to get a perfect reproduction of color, while certain shades absolutely cannot be reproduced.

As a motion picture is projected by transmitted light, it can easily be seen that there are two ways of obtaining a colored picture on the screen. The first is to recombine our three primary-color images in a fully colored print, so that, starting with the white light of the projector, the print itself removes from the beam all of the color-frequencies save those desired to make up any given portion of the pic-

A New

ture. This is known as the Subtractive method. The second method utilizes a simple black-and-white print, and places appropriate filters between the film and the screen, virtually adding color to the shadow of the black-and-white image. This is known as the Additive method.

Subtractive printing has made great strides within the past few years, but as it almost invariably depends on replacing or supplementing the regular photographic image with one or more dye-images, the process of printing is intricate.

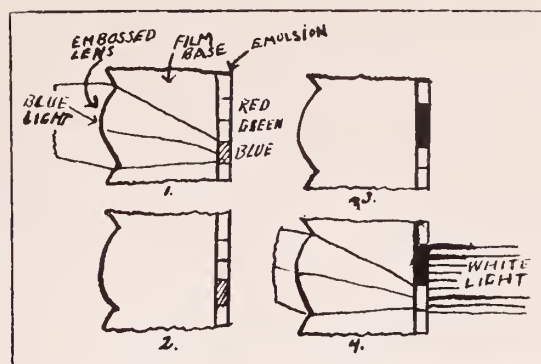
The Additive method relies on well-understood black-and-white printing methods, and achieves its colored picture by photographic means. The image is photographic, colored only by the filters.

In the Keller-Dorian process, the Additive method is used, contrived so that the three necessary primary-color separations are formed in a single image on a single frame. A special film is used, with minute cylindrical lenses embossed on the film-base. The film is threaded into the camera with the emulsion away from the lens, and the myriad tiny lens-strips embossed on the film-base facing the lens. On the lens itself is placed a filter which consists of parallel strips of red, blue and green. The lenticulations on the film-base each forms a microscopic image of the filter stripes on the emulsion, with the result that the picture as a whole consists of an infinite number of parallel strips, each photographed through one of the three primary-color filter areas on the lens. Thus in photographing, for example, a blue object, the blue light passes freely through the blue-filtered section of the lens, but is absorbed by the red and green filter-sections. The embossed lenticulations on the film-base reproduce this condition in making the exposure: the area governed by the blue filter is the only one exposed, while the adjacent red and green filtered strips receive no exposure. When the film is developed, the blue area is dense, and the unexposed red and green filtered areas are clear. In the positive, this is of course reversed; the red and green filtered strips are opaque, while the blue strip is clear. In projection, filters similar to the taking filter are fitted to the projector's lens. Thus white light from the projection-lamp falling upon this area will be able to pass through only the blue-exposed strip. From this, the tiny lens embossed on the film-base guides it to the blue-filtered part of the projection lens, and the image of the blue object is re-created on the screen, in its original color.

In practice, any camera satisfactory for studio use may be fitted with the Keller-Dorian optical system and used to photograph color by this process. The lens used is of special design, with an effective aperture of $f:1.9$. The filter-unit is mounted in the center of the lens, between the elements. The front element is fixed, but the rear element is interchangeable: using different rear elements in combination with the fixed front element allows the lens to be converted to any desired focal length without disturbing the necessarily delicate relationship between the lens, filter and film-embossings. A special anti-fringe optical unit is mounted directly in front of the aperture. This re-focuses the red-filter image, keeping it constantly in register with the blue and green ones regardless of the focal setting of the lens, and eliminating the red fringe sometimes noticed in out-of-focus Kodacolor.

Three-Color Process

by
William Stull, A.S.C.



Action of lenticular embossings

Due to the nature of the process, the reversal system is used instead of the familiar negative-positive. Thus, the film originally exposed in the camera is reversed into a positive image for projection. Release-prints may be made optically, or by contact-printing, a reversal emulsion being used in either case. The quality of the prints is in every way comparable to that of the original, and as the printing process is a simple photographic operation, the results are uniform and economical.

All that is basically necessary for projection is to apply the requisite projecting-filter to the lens of any good, modern projector. The best results will naturally follow the use of a fast lens designed to coordinate with the filters and lenticulations. As in all color processes, a projection lamp of the highest intensity is preferable.

In photographing, essentially normal black-and-white technique can be used. Incandescent lighting is employed, and the increase in intensity over the average black-and-white level is not excessive: from 30% to 50% more light is generally used, and balanced a trifle flatter than would usually be done in monochrome filming. According to the individual technique of the cinematographer, this increase may be obtained either by the use of more lamps, by the use of larger or more efficient ones, or by using less diffusion with his usual lighting. The chromatic differences between Mazda and sunlight are quickly compensated for by a simple adjustment of the taking filter which reduces the area of the red section. By this same means, it is also possible to secure any special color-balance which the cinematographer may desire.

Any cinematographer can make successful color-films by this process after only a few hours' instruction and explanation. Virtually every Director of Photography on the Paramount staff has photographed tests in color by this process, with uniformly excellent results. The writer has viewed tests photographed by such men as Charles Lang, A.S.C., Victor Milner, A.S.C., Karl Struss, A.S.C. and others: In each instance, the individual artistic technique of the cinematographer was as plainly evident in the color-film as in the artist's more accustomed black-and-white.

Anything possible in black-and-white photography appears to be equally practical in Keller-Dorian color. In the realm of special-effects Cinematography, miniature and optical-printer shots should be quite practical; and while color's requirement of increased light in both projection and photography is an undoubted problem in the making of background-projection shots in color, no other difficulty appears to exist.

The problem of printing was for a long time the stumbling-block of the Keller-Dorian process. Today, due to the researches conducted by the Paramount and Eastman experts, first-class color-prints can be made either optically or by contact, and made economically. Moreover, thoroughly satisfactory black-and-white dupes can be made from the color negative, in order to supply theatres not equipped for color-projection.

The definition obtainable in either originals or prints is quite on a par with black-and-white. The question naturally arises, "Do the embossed lenticulations on the film-base interfere with the definition, or show up unpleasantly on the screen?" In both cases, the answer is no. The lenticulations are so extremely minute—29 to the millimetre, or approximately 724 to the inch—that they are invisible except when one approaches abnormally close to the screen. Many of the earlier tests were made with a much coarser embossing (550 to the inch), and tests in theatre projection showed that in the average theatre, the lines were not seen by anyone seated beyond the fifth row of seats. Moreover, if conditions warrant, it is at present possible to use still finer embossings, up to 35 lines per mm. (875 per inch). A further advantage is the fact that instead of running vertically, as in the amateur version of the process, the embossings are disposed horizontally—a fact which in itself renders them less evident.

Sound-recording is done in the usual manner, the only change necessary being that, due to the reversal, the track is recorded at the opposite edge of the film. The track is contact-printed onto the release-prints in much the usual manner. The embossings do not, according to tests made by sound experts, in any way interfere with sound quality; ground-noises due to the film are almost identical with those now occurring in black-and-white production. Should it be necessary, however, the sound-track area may be left clear of embossings, giving a track in every way identical with those on monochrome releases.

The economic side of the question is of interest. The cost of equipment for Keller-Dorian color production is essentially the same as for black-and-white. Standard black-and-white cameras, lighting equipment, etc., are used, and standard developing-machines can be converted to meet the added needs of reversal-processing. In actual production, a unit using this process can work quite as efficiently as it would making the same picture in black-and-white. The extra expense of art-direction and costuming for color will be approximately the same for any color process: the exact increase (if any) over black-and-white requirements would naturally depend on the producer's individual policy.

The photographic cost is very little higher than that of monochrome filming. The camerawork can be entrusted to the studio's regular camera staff; virtually all technical details can be handled by regular black-and-white-trained personnel. Lighting-costs are maintained close to the black-and-white level, since regular incandescent equipment can be used. The charges for film, processing, "rushes" and release-prints for an average Class "A" feature produced in Keller-Dorian color may be estimated at approximately \$9 per release foot, as compared to \$4.50 for black-and-white. This is on a semi-experimental basis; in volume production it is estimated these charges would be materially lowered, bringing the costs of the process into even closer alignment with black-and-white.

Problems of Controlling Correct

FROM THE FOREGOING ARTICLES we might now conclude that the principal difficulties in rendering correct photographic reproduction are caused by the following reasons:

- a. Total visual contrast in the natural object is composed of three variables, brilliance contrast, color-hue contrast, and color saturation contrast. Contrast in the photographic reproduction can only be rendered by brightness contrast.
- b. The color sensitivity curve of the eye is far different from that of any negative emulsion.

It is indeed remarkable that the professional cameraman, thanks to his sense of feeling and intuition, is able to overcome these difficulties regardless of the fact that he is not provided with instruments which would enable him to measure these variables quantitatively, and to adjust exposure and lighting conditions correspondingly. It might also be considered lamentable that the present day technic in this respect is comparable to that of the days when the "negative timer" was forced to judge the printing lights by visual examination of the negative without the aid of the Cinex tester. The question, therefore, arises as to what has been done and could be done to mechanize measurements of these existing differences by means of reliable instruments.

It has been mentioned before that correct photographic reproduction involves two different problems, that of exact reproduction of brightness distribution in the object which is referred to as "Orthochromatic reproduction," and that of deliberately distorted reproduction.

Orthochromatic reproduction requires balancing of the color sensitivity curve of the negative film material used to that of the eye. This can be done by photographing through a compensating filter. The spectrophotometric transmission curve of such a filter is constructed by dividing the ordinates of the visibility curve by the corresponding ordinates of the photographic sensitivity curve of the negative material and by plotting the values thus obtained against wave length. A filter of this type, in combination with suersensitive Panchromatic emulsions, would be rather prohibitive for practical use due to the magnitude of the exposure factor necessary. For this reason a compromise must be considered and for practical Orthochromatic reproduction filters of a dark yellow or yellow-green color are used, such as Wratten G or Aero Nos. 1 and 2, which give sufficient approximation to the theoretical ideal in combination with supersensitive Panchromatic negative film.

In connection with Orthochromatic reproduction, different monochromatic viewing filters are in existence and are widely used by the cameraman. Filters of this kind, like for instance, the Wratten yellow filter No. 90, transmit only a narrow region of the spectrum. In looking through such a filter it is possible to distinguish between a red and a green, but the difference between these colors is so subdued that relative differences in hue or saturation cannot be determined any longer. This enables the observer to judge the object to be photographed by brilliance differences only, and thus to anticipate the results of reproducing total visual contrast by brilliance contrast alone before the exposure is made.

In speaking of black and white reproduction, it will be clear that the problem can only consist of correctly repro-

Photographic Reproduction

PART 5

by

Dr. Herbert Meyer, A.S.C.

Head of Hollywood Research Bureau,
Agfa, Ansco Corporation

ducing total visual contrast, which means it is not primarily necessary or even desirable to reproduce correctly one of the three single factors of which total visual contrast is composed. If we consider for instance an object in which brilliance contrast is absent or zero, it will be necessary to reproduce in the negative and print the remaining hue or saturation contrast or both by means of brightness contrast. This means that if different areas in the object are equal in brightness, it is only by destroying this equality that an existing visual contrast due to hue or saturation difference can be correctly registered in the photographic black and white reproduction.

Assuming now that the different color hues in this case are caused by reflected radiation to which the negative material is equally sensitive, it will be seen that to render hue contrast in spite of this condition, a deliberate distortion has to be made. This is accomplished by the use of light filters, which for this reason are also frequently referred to as contrast filters.

Important in connection with this problem of deliberately distorted reproduction is the correct conception of the rather simple principles underlying the proper direction and the necessary degree of any contemplated distortion. To render a color lighter on the photographic brightness scale of the final reproduction, a filter must be used which selectively transmits the same color. To render a color darker a filter must be used which selectively absorbs this color.

As far as the direction of the distortion is concerned there exist certain physical and psychological laws which make it appear best to render colors of longer wave length lighter than those of shorter wave length. The former include red, orange, yellow and yellow-green, and may be referred to as "warm colors". The latter include blue-green, blue, and violet, and are called "cool colors". In case of non-spectral hues, the purples, which reflect red and violet, the ones in which red predominates, are classed with "warm colors", while those in which blue predominates are classed with "cool colors".*

In addition to the monochromatic viewing filters mentioned above, another type of viewing filter is of interest and is also frequently used in practice. This filter is of a purple tint, thus enhancing red and blue colors, and de-

* (L. A. Jones, S.M.P.E. Journal, Vol. XI, number 30, page 164 and following).



Hal Mohr, A.S.C.

Hal Mohr, A.S.C. Captures Academy Award

HAL MOHR, Past President of the American Society of Cinematographers, was pronounced the industry's premier cinematographer for 1935, receiving the annual cinematographic award of the Academy of Motion Picture Arts and Sciences for his achievement in photographing "A Midsummer Night's Dream." The current award was the first in which the academy's rules permitted write-in votes for candidates other than the officially-nominated slate, and Mohr, in a closely contested balloting, captured first honors as a write-in candidate. So unexpected was this result that Mohr, at the time completing the camera work on "The Green Pastures," had literally to be roused out of bed to be honored.

Photographing "A Midsummer Night's Dream" was in many ways a difficult assignment, and Mohr's achievement has brought him universal acclaim. No production of recent years has owed more to the magic of the camera. In no recent production have the critics paid so lavish tribute

to the cinematographer. Almost every review of "A Midsummer Night's Dream" has accorded to the camera work far greater praise than acting or direction; some of them, in fact, have so greatly stressed Mohr's contribution that neither space nor superlatives remained far more than passing mention of cast and director. This praise was merited, for despite the imposing array of stellar and directorial talent, and the sumptuous production, the film is definitely a cameraman's picture.

The technical and artistic problems which Mohr faced were decidedly out of the ordinary. The story intermingled fantasy and reality, with sprites and fairies moving among flesh-and-blood mortals, and effecting supernatural transformations. The two moods could seldom be given an arbitrary separation, but had to be artfully blended in almost every scene. Fred W. Jackman, A.S.C., and his special effects staff contributed outstandingly to many of the bizarre effects, while the making of many other scenes which would ordinarily be classed apart from normal production camera work, devolved upon Mohr and his production crew. From the standpoint of camera-trickery alone, "A Midsummer Night's Dream" was a noteworthy achievement. So, too, was it from the mere formal aspect of photographing a mammoth production, and lighting a literally all-star cast. The technical problem of blending real and stage-made exterior sequences was in itself a test of cinematic skill. And with all these technical intricacies confronting him, Cinematographer Mohr succeeded, moreover, in attaining a very high level of sustained pictorialism.

In accepting his award, Mohr says. "In photographing this picture, I had an opportunity to do, on a rather spectacular scale, what every cinematographer worthy of the name strives to do on any production: explore a few of the possibilities of our marvelous art-science. We must constantly seek new ways of picturing old stories, or we cease to progress. Under the conditions which apply to the making of all too many of our films, the cinematographer does not have the opportunity to realize this aim as fully as he desires, though careful analysis shows that even on the least promising productions, our true camera artists are always trying to do so. "A Midsummer Night's Dream" upon which the full resources of a great company were lavished, gave me an opportunity to strive more fruitfully toward this goal. That I attained some measure of success was due not to any personal achievement, but to the whole-hearted support of my co-workers, Operative Cameraman Robert Surtees, A.S.C., and his assistant, Louis De Angelis, A.S.C., to Fred Jackman, A.S.C., and his entire special effects staff, and to Fred Gage and the Warner Bros. laboratory."

Winning second place in the balloting, Victor Milner, A.S.C., with "The Crusades," came within the narrowest margin of attaining the distinction of being the first cinematographer to capture premier honors for two years in succession; "Cleopatra," it will be recalled, brought him the 1934 award, while in the opinion of many observers, his current production was an ever finer achievement. Ray June, A.S.C., with "Barbary Coast," took third place, and Gregg Taland, A.S.C., with a notable film in "Les Misérables," filled the fourth position in the most closely contested award in the academy's history.

Among the other winners may be mentioned Douglas Shearer, A.S.C., who as head of the Metro-Goldwyn-Mayer sound department, received the award for the year's best in sound-recording, for "Naughty Marietta."

The awards for scientific and technical achievement brought forth a greater profusion of nominees than any previous year. The nominations in this group tripled those received in 1934, which in turn were double those of 1933.

Continued on page 152

Rapid



FIG 1

Fig. 1. Appearance of step tablet exposures on Supersensitive Panchromatic cut film, showing relative effect of various developers in the underexposure region.

Methods of Printing

IF DESIRED, the time required for drying the film can be saved by making the prints from the wet negative. This requires some special means for holding the negative, because the usual method of sandwiching the film between sheets of glass is not satisfactory when the film is wet, because the glass becomes heated under the printer light and tends to soften the emulsion, melting it or making it stick to the glass. Also, any buckling of the film caused by uneven or partial drying would tend to form interference rings about the points of contact with the glass.

These difficulties can be avoided by the use of a special holder. The one shown in Figure 2 which grips the negative only by the edges is very satisfactory and convenient to handle, or the Eastman processing frame, illustrated in Figure 3, which is designed to hold cut films so that they may be handled and processed like plates may also be used to hold the film during printing. In either case, the excess water drops must be carefully removed from the surfaces of the film by wiping with moist absorbent cotton, chamois leather, or viscose sponge. When the processing frame is used, the water should be shaken as completely as possible from the grooves of the frame before the film is wiped and care exercised thereafter to prevent shaking more water drops out onto the surface of the film.

Another useful device, though it can be used only with a horizontal enlarger, is shown in Figure 4. This is a very thin liquid cell made of two sheets of glass clamped by the metal frame to a U-shaped separator cut from soft sheet rubber. The cell is large enough to receive the negative and just thick enough (1 to 2 mm.) to allow the film to slide in freely. The frame should grip the glass sides just tightly enough to hold them firmly, but not tightly enough to cause any strains. It may be necessary to soften the surfaces of the rubber separator by moistening with benzine just before assembling the cell to make the joints watertight. The cell is filled with water which has been boiled to free

it of dissolved air or it can be filled with fixing bath or hypo solution. In the latter case, it is unnecessary even to rinse the film after fixing, since the liquid in the cell will then have almost exactly the same density and index of refraction as the liquid remaining on and in the film after treatment in the fixing bath. Since the cell may become quite hot if a large number of prints are made, the solution used in the cell should not have a tendency to sulfurize easily. Plain acid baths such as the F-24 fixing bath give very satisfactory service, even when ammonium chloride has been added to give very rapid fixing.

In most projection printers and enlargers there is rather inadequate provision for cooling the lamp house and the negatives are subjected to considerably more heat than is necessary. In most cases, considerable cooling can be effected by providing forced ventilation with compressed air. If the negative is held in a water cell, the air blast may be thrown against the cell to cool it directly, but the greatest advantage is obtained from the general cooling of the lamp house. For direct protection of the negative from the radiant heat of the lamp, a water cell similar in construction to the negative holder but about one inch thick, or a piece of heat absorbing glass, such as the Aklo Heat Resisting Glass made by the Corning Glass Works, or, better, a combination of both, should be placed between the lamp and the negative. If desired, the heat absorbing glass can be used to form one side of the cell. Such a combination will absorb almost all of the infrared or heat radiation which would otherwise heat the negative, without noticeably affecting the visual or the photographic intensity of the light.

If the liquid cell is used alone, it is more effective to use, instead of plain water, a 5 per cent solution of copper sulfate or a 2 per cent solution of cupric chloride which absorb practically all of the infrared radiation. If the printer is to be operated more or less continuously, some provision should be made for removing the heat absorbed by the liquid. This can be accomplished by circulating the liquid through some type of cooling coil. If plain water is used in the cell, this can be cooled by circulating through an automobile hot water heater, the blower fan serving to pull cooling air through the radiator coils.

The General Electric Company has produced a special high intensity lamp which has a water cell built completely around the bulb. The end of this water jacket contains a cooling coil through which tap water is circulated to carry away the heat, while distilled water is used in the jacket to insure highest transmission for the visible light. This lamp can be installed readily in the enlarger, the only requirement being that the lamp be used in a vertical position with the base up.

If a water cell is undesirable, a sheet of heat absorbing glass may be used alone. In this case, the glass should be adequately cooled to remove the heat absorbed. This can be done by forced ventilation around the glass.

PRACTICAL RECOMMENDATIONS

For convenience, the foregoing recommendations were summarized briefly, and the formulas of the various solutions used were given.

Processing Methods

PART 3

by

H. Parker and J. I. Crabtree

Communication No. 577 from the
Kodak Research Laboratories

Two Bath Development

The two bath developer (Formula SD-6) provides for thorough hardening of the emulsion during development, it may be used at temperatures from 65° to 86°F. (best results are obtained at 75° to 80°F.), and it gives a fairly constant degree of development in spite of variations in the development time. The solutions are stable and are not readily oxidized even when standing in trays. The negative should be placed for 1 minute in the first bath, then transferred to the second bath without rinsing, and treated for 1 minute with agitation, taking care not to expose the film unnecessarily to the air in order to avoid aerial fog.

If this treatment does not give sufficient contrast, the negative can be rinsed for 1 or 2 seconds and returned to the first bath for 15 to 30 seconds or longer as desired. This developer is not recommended, however, in cases where it is necessary to obtain the highest contrast or the highest possible emulsion speed.

After development the film should be rinsed for a few seconds in water or an acid stop bath, and fixed in the F-5 fixing bath. It may then be washed briefly in running water and dried rapidly with warm air blasts (conveniently obtained with small electric hair dryers), or it may be placed in one of the holders described and printed from while wet.

When rapid fixing is desired, it is preferable to increase the hypo concentration to 12 ounces in 32 ounces (360 grams in 1 liter).

Single Bath Development

If the solutions for the two bath developer are not available, the D-72 developer may be used full strength, developing about 2 minutes at 65°F. The solution may be used up to 80°F. with the development time reduced accordingly. After development the film should be rinsed for about 5 seconds in an acid stop bath and fixed for 3 minutes or longer in the F.-23 chrome alum fixing bath with thorough agitation, especially during the first minute (at temperatures below 75°F., the F-5 fixing bath may be used).

If the film is not agitated when placed in the chrome alum fixing bath, a greenish-white scum of basic chromium sulfite may be deposited on its surface. This should be removed by swabbing the wet film with moist absorbent cotton, since it is very difficult to remove after the film has been dried. Its formation can be prevented by rinsing and agitating the film properly.

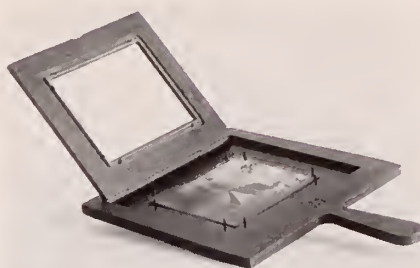


Fig. 2. Holder for printing from wet negatives on cut film.



Fig. 3. The Eastman Processing Frame, which allows cut films to be handled like plates during processing and enlarging.



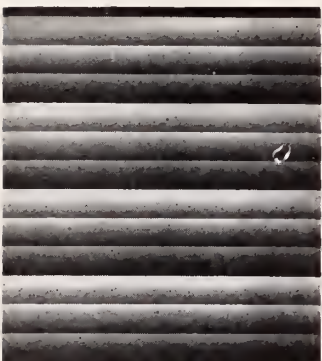
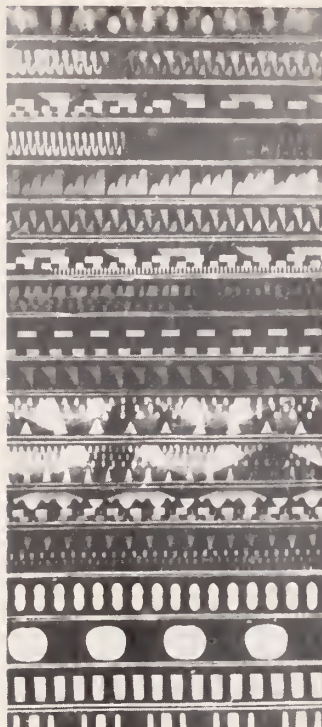
Fig. 4. Thin water cell for holding wet cut films in the enlarger.

The use of a hardening stop bath is not recommended, because the time available for treatment in the stop bath is only a few seconds, much too short for any effective hardening action.

Development at Higher Temperatures

With the two previous methods of development, if the room temperatures are very high, it is necessary to cool the solutions to about 80°F. If this is not desirable, the D-9 coustic process developer with the addition of 1 per cent formalin may be used at temperatures up to 90°F. The development time should be 1½ to 2 minutes at 65°F., and less at higher temperatures. After development the

Continued on page 150



Top: By means of his discs, Sholpo obtains on the photograph ornaments with various "teeth" giving various timbres, strength and pitch. (From Sholpo's earlier works.)

Bottom: Specimen of the ordinary "intensive" shadow recording, on which Yankovsky is working, obtaining the transverse bars by sliding copying paper.

THE recording of sound upon the sound path of a moving picture film (a narrow ribbon alongside the picture), is usually done in the following way: a musical instrument is played in front of the microphone, the vibrations of the microphone membrane are transferred electrically to the lamp amplifier, and further to the sound recording apparatus where different parts of the sound ribbon are exposed to different intensities of light by means of an oscillograph or some other device. This method involves a good deal of time, and encounters considerable mechanical and electrical hindrances.

From the very beginning of the sound picture epoch, A. Avraamov, the Soviet musical theoretician, together with Pfeniger, the German, and Sholpo and Voinoff, former co-workers of Avraamov, have wondered whether it would not be possible to throw light and shade upon the sound ribbon in a direct manner, by photographing upon the sound ribbon certain ornamental figures — drawings or cardboard or paper designs.

At first, the sounds obtained were mostly of the flute timbre type. Later, a three minute "Hurdy-gurdy" item was tried, and, the timbre of the street organ, being of simple construction, turned out most successful.

Then Voinoff made his "piano," all of which can be fitted into a necktie box. Each of its keys, i. e. each half-tone is represented by a long "comb," which is a schematized record of the real piano. This schematization did not harm the achievement of the purpose. Voinoff complains only about the extreme bass notes,

Absolute

which, he says, having lost some of the overtones, do not sound as rich. Voinoff has not been able to add the necessary little "teeth" to the large basic ones.

Voinoff fits his "keys" or "combs" on to the regular appliance for multiplication photographing in such a way as to have the "key" exactly on the sound ribbon during the photographing process.

In this manner he has succeeded in photographing two three-minute items: a Prelude by Rachmaninoff, and a fox-trot, "The White Monkey." The Prelude showed especially interesting results. The "designed music," (to be more exact, it was music cut out of paper), came out as an abstract design of diverging circles and prisms. Voinoff has also recorded a multiplication film, "The Thief," in which he has preserved very exactly the rhythms of the whole thing.

Artificial sound seems most suitable for accompanying multiplication films. Its notes have no reverberation whatsoever, they do not create an acoustic "atmosphere" (i. e. a sound perspective for the picture to which they are attached).

Generally speaking, music sounds especially agreeable in two cases. One case, for instance, occurs when, on putting on head phone and hearing an orchestral broadcast with the sound perspective of the concert hall fully preserved, one feels as if one were actually present in the concert hall. Or it may happen that the loud speaker in a room creates the complete illusion of music being performed in that very room. This is the case when the acoustics of the radio studio and of the room with the loud speaker somehow correspond to each other.

Radio utilizes this absence of reverberations in "designed" sound very willingly. By broadcasting records of "designed sound," radio, in reality, broadcasts music without reverberation, while the listener hears it with the reverberations of his own room where the listening process takes place. "The designed music of the radio" cannot fail to harmonize with any premises. Any one who has heard the "whispering" of radio heroes in some large halls (a thing frequently encountered, for instance, in radio plays), knows well how falsely such acoustic absurdities sound.

E. Sholpo, of Leningrad, has introduced methods somewhat different from those of Voinoff, and still more refined. He makes his teeth not in the form of a comb, but in the form of a round see-saw with teeth of different size according to the pitch of the octave which the "see-saw" must transmit. The higher the pitch, the closer together must the teeth be. Within the octave, Sholpo regulates the quantity of the teeth by means of a more or less frequent circulation of the disk, in dependence upon which the combs are photographed on the moving picture film with more or less frequency. Recently, Sholpo has substituted slots for teeth; this adds to his disks greater exactness and practicability. Together with Rimsky-Korsakoff (the composer grandson of the famous Rimsky-Korsakoff), he has recorded on a film a number of items by Rimsky-Korsakoff, and a few new works. Anyone who has heard the "March-Trot"—a short jazz piece played on . . . birds' voices will

Music by Designed Sound

by
V. Solev (Moscow)

never forget it. "March-Trot" is a serious contribution to the wealth of world music.

Timbrograms—Music of the Future.

All those engaged in work on "artificial sound," have until very recently recorded it by means of lines (transverse recording). At Potilikha, in Moscow, there is a man called Tager, who has discovered unexpected opportunities in shadow recording ("intensive," nuance recording).

Tager's strips of shadow correspond to Shorin's "teeth."

By photographing them on a different scale, Yankovsky has obtained a different pitch of sound but in the same timbre as the design taken as the basis. Naturally, he chooses, for the starting point, the most richly sounding note of each instrument.

The fact that Yankovsky's "timbrograms" promise to furnish sound of any pitch with the timbre of the best note of the instrument is of tremendous importance in principle. It is known that the higher the pitch, the poorer is the timbre of any musical instrument. (The extreme upper notes of the piano, for instance, are quite "dry"). This phenomenon takes place because the material used in the making of the instrument (wood, copper, etc.) reflects differently in each case sounds of different pitch. Various instruments made of various materials and of various forms possess greater or lesser quantities of fully sounding octaves. The piano sounds well within a big range; other instruments are considerably poorer in good octaves. All depends upon the instrument.

One might say that Yankovsky creates "multiplication instruments" which are not dependent upon any acoustic whims, simply because, once and for all, the best sound is taken as the basis.

This possibility is far more interesting than abstract research for "new sounds," in which up to now the workers in the field of the "designed sound" have been engaged. Regardless of whether it has been a long or a short process, whether it has come easily or has involved a tremendous amount of time, labor, and patience of audiences, the fact remains that during the centuries of its existence, our orchestral practice has chosen the timbres most acceptable to our ears, (just as Oriental practice has chosen its own timbres).

The modern symphony orchestra is very rich in sounds, and it is impossible to discover immediately something utterly different in this line. The point is, that by no means

every instrument of the orchestra is in harmonious relations with its neighbors. Orchestra instruments do not represent a finished system; especially important is the fact that the range of possibilities is different in all instruments. These are the gaps that Yankovsky promises to remedy.

Sholpo of Leningrad also is seriously thinking of changing over to the field of Yankovsky's "timbrograms." For they can be utilized on the multiplication film apparatus, as well as for the recording of the paper designs in motion, as has been done by Sholpo.

Musical Horizons.

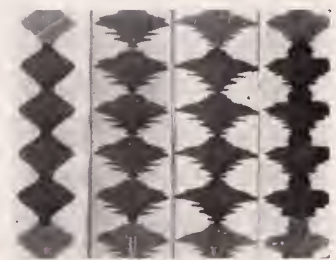
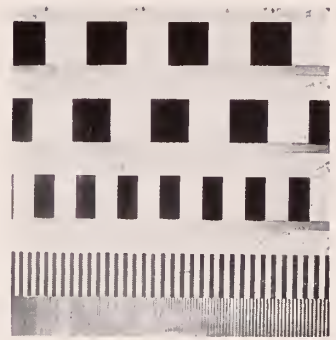
What does "designed sound" sound like?

It would be wrong to suppose that the very first steps open up possibilities for altogether new timbres. These have not been obtained. Until recently, instrumental technique was groping its way towards new sounds. Nevertheless, experience in the field is colossal.

During the nineteenth century alone there were twelve thousand patents dealing with musical technique. The choosing of new sounds, new timbres, and improvement of the already existing ones has, therefore, been a ceaseless process. If it were possible to get altogether fantastic timbres, they would fail to stir the listeners aesthetically.

But it would be an altogether different matter if we should succeed in getting series of intermediary timbres, for in-

Continued on next page



Top: Early attempts to produce "designed sounds." These designs gave a timbre of the "hurdy-gurdy" type—simple and bare.

Center: How the sound of a French Horn arises and continues. The periods appear almost instantaneously and die away with a singing note.

A piano gives a much shorter period.

Bottom: Multiplication film for television ("the March of the Chess Figures") to be broadcast with "artificial sound".



E. Sholpo of Leningrad, sketching the slot-teeth on his discs. These figures are then photographed on the sound path of a moving picture film. It would be truer to speak of "photographic sound" than "designed sound."

stance timbres between those of wood and brass winds, with different sordines. In this case, "designed sound" has justified itself from the very first steps of its existence. Even a few years ago, sounds of the type of different wood wind instruments were obtained. Such intermediary timbres are today often obtained by Voinoff, to say nothing of Sholpo of Leningrad, who has been working by a more subtle method.

The dream of the symphony orchestra reformers, who have in vain struggled for some degree of smoothness of transition between different instrumental groups, may be realized by means of synthetic music, particularly by the music of Yankovsky and Sholpo. The simplicity of the photo-copy method used by Yankovsky, together with the rapidity of Sholpo's methods promise to do very much in this direction.

The dearest dreams of the "automatisators" of music may become a reality. The violin will walk across the viola and the cello directly beyond the double bass. The lowest sounding brass wind instrument, the tuba, will rise above the highest brass wind—the trumpet. Triangles will sing, not ring. The piano, preserving the crystal clearness of its sound, will sound as prolonged as the harmonium, with its sound rising from the most tender pianissimo to colossal force. The flute will go down beyond the bass clarinet. The bassoon piccolo will go up beyond the flute piccolo. There will be smooth modulations from the violin to the clarinet, to the horns, to the percussion. The gaps between the violins, the wood and the brass wind instruments, between the bow, the percussion, and the plucked instruments, and even choruses will be done away with. These groups of instruments are not so far apart in regard to timbres. The "multiplication" orchestra of the future can be clearly foreseen even now, in the form of an unbroken continuation of timbres, from the tenderest flute to the double bass, without any parasitical soundings.

At present there does not exist an instrument which apart from musical sounds, (i. e. those with regular wavelike vibrations) does not produce also sounds of a disorderly, noise like character. The whistling of the winds, the rustling of the violins . . . Violing noises for instance form a relatively large percentage of violin sound.

Analysis of phonograms will allow us to overcome this, also. The noise "teeth" might be removed from the phonogram of the given instrument. Later, one might use the phonogram cleared of them.

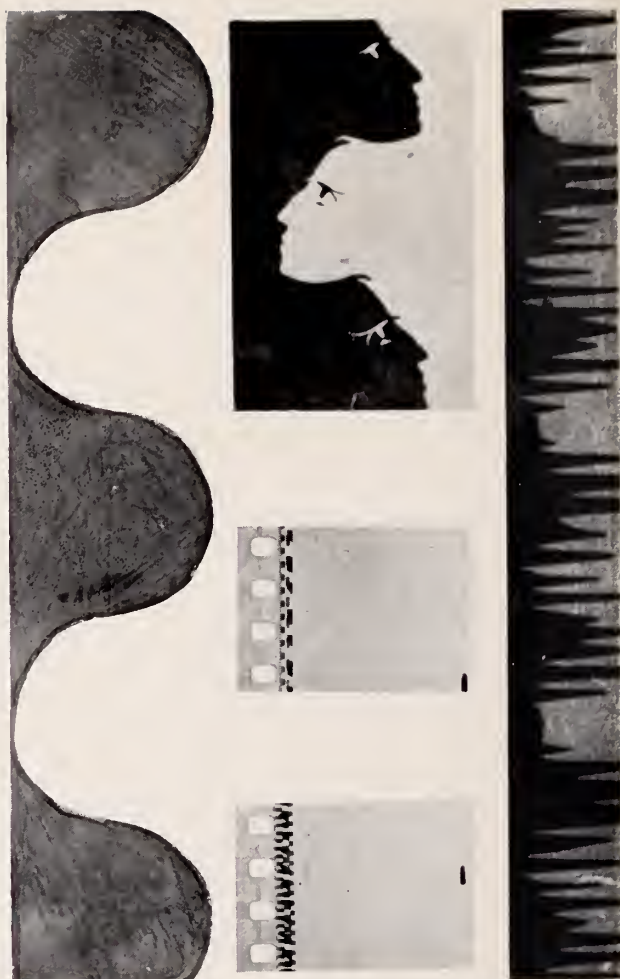
We will get rid of the negative aspects of the sordines which have introduced new noises into the brass instruments since their appearance.

We shall know what it is that distorts to shrieking point the sounds of the cornet-a-pistons and the English horn in its higher registers. These instruments might be introduced into the regular symphony orchestras.

The lower notes of the bass tuba, for instance, have a very poor sound. It has been known for a long time that they are very poor in overtones but nothing could be done about it. Yankovsky has looked at the phonogram of the tuba;—yes, in the lower notes there are only large and infrequent "teeth" and very few little ones. But isn't it possible to draw them or to photograph on a larger scale the picture of the richer middle register notes? Yes, that is what Yankovsky is doing now. The new member of the orchestral polyphony is ready.

A problem of this sort would probably alarm even Prof. Sarnett, the French transformer of musical instruments for the radio. It seems as if he does not go beyond the improvement of the transmission of that which the orchestra already possesses. Basic change in the acoustics of the instruments themselves lies beyond his purpose.

The fullfreedom of the technique of interpretation promised by "designed sound," might bring to life a number of instruments, such as harps, which are beginning to become



Left: It is difficult to analyze a curve of this type into a series of others. It was thought that it would give a complicated sound, but practice did not bear this out. Everything, depends, it seems, on the presence of small "teeth."

Top center: Experiments made by Avraamov and Yankovsky showed that a profile usually sounds like a violincello. The profile is taken in such a way that the black silhouette corresponds to the white one, in accordance with the law of sound recording which says that phases must follow each other alternately.

Lower center: Two sound tracks obtained by photographing Sholpo's discs (each track gives a different timbre of sound).

Right: Natural sound track of a piano on a cinema film. It can clearly be seen how the same group of "teeth" repeat itself at definite intervals (the film moves so rapidly that every sound has time to be recorded in the form of several "periods," making it easier to distinguish its boundaries from those of neighboring sounds.)

obsolete. Trumpets will play without stops for breath. A fairly like accumulation of "orchestra" tempo might become possible.

By building a chord out of tones of any pitch, it will be possible to create altogether new harmonies, outside the reach of present day instruments.

"Designed sound" also makes it possible to give melody and harmony "glissando" fashion (i. e. sliding up and down, like the howling of the wind). This sliding of the vocal tone is frequently used in singing, especially in Gypsy and Persian singing. The Hawaiian guitar has something of the kind. "Designed sound" offers the possibility of such a sound to any other instrument. (This has been done, by

Continued on page 154

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RAPID PROCESSING METHODS

Continued from page 145

film should be rinsed for about 5 seconds in an acid stop bath, and fixed until it has cleared in the F-5 fixing bath.

The proper development time at any temperature can be determined from last month's table, if the time which gives the desired degree of development at 65°F. is known. Although the temperature coefficients of the other developers vary slightly, this table is sufficiently accurate for use with any of the developers mentioned in this paper, except the two bath developer for which the times need not be changed over the temperature range form 65° to 85°F.

SUMMARY

In press photography, it is often necessary to obtain a print from an exposed negative as quickly as possible. The time required by each step in this process must be considered in order to obtain as great a reduction in the total time as possible.

A rapid hardening two bath developer is very well suited for these conditions, because of the following properties:

- (a) It can be used at temperatures from 65° to 85°F.

- (b) It develops and hardens the film in 2 minutes.
(c) Small errors in timing have very little effect on the development.
(d) The solutions are stable and not very subject to aerial oxidation.

This developer is best followed by the F-5 fixing bath, but if desired, an ultra rapid fixing bath, such as the F-24 with 2½ per cent of ammonium chloride added, may be used.

Other developers which are particularly suitable for special circumstances are:

1. For processing normally exposed negatives at room temperatures from 65° to 80°F., use D-72 full strength, rinse for a few seconds in the SB-1 acid stop bath, and fix in the F-23 chrome alum hardening fixing bath.
2. For rapid development at temperatures up to 90°F., use the D-9 developer with the addition of formolin and phenosafranine, rinse in water or an acid stop bath, and fix in the F-5 fixing bath.
3. For maximum emulsion speed (maximum shadow detail), regardless of contrast, develop in D-82 at 65°F. for about 8 minutes.

4. For maximum emulsion speed ob-



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tainable in a short time, add 10 grams per liter more sodium hydroxide to the D-82 and develop at 65°F. for the time available, up to 3 minutes. If the available time is less than 30 seconds, add ammonia to this developer.

5. If maximum highlight density is required regardless of time of development or shadow detail, use D-8, D-9, or D-82 plus caustic at 65°F. for the time shown in Table II.

6. Provided maximum shadow detail is not required, for maximum gamma in a minimum time, use D-8 at 65°F.

The time required for drying may be

saved by printing from the wet negative, supported in a special holder, or held in a thin liquid cell containing water or fixing bath.

When many prints must be made, the negative should be protected against overheating by providing forced ventilation of the printer lamphouse and by the use of a water cell or heat absorbing glass before the lamp.

Hal Mohr, A.S.C., Captures Academy Award

Continued from page 143

No award was made, however, in Class I, (Academy Statuette and Plaque), but two certificates of merit were awarded in Class II. These were given to the Agfa-Ansco Corp., for the development of the Agfa Infra-Red film which, in the opinion of the judges, "has resulted in a significant improvement in photographic quality and has particularly increased the facility with which transparency and effect shots are made." For the development of the Pola-Screen, the Eastman Kodak Co. received an award because the Pola-Screen "helps to remove certain limitations in photography and is . . . an important contribution to the art and science of motion picture production."

Seven awards were made in Class III, consisting of honorable mention in the report of the board of judges. These went to the Metro-Goldwyn-Mayer Studio for the development of anti-directional film-development, the practical application of which "constitutes a meritorious advance in the laboratory field"; to the Mole-Richardson Co., for their development of "Solarspot" spotlamps, reported "a valuable contribution to the industry in . . . a light unit essentially for motion picture photography, utilizing improved optical design and construction." Another award went to Paramount Productions, Inc., for the design and construction of the Paramount Transparency Air Turbine Developing Machine which "marks a notably progressive step in the processing of motion picture film." In the non-photographic field, these awards were given to William A. Mueller of Warner Bros.-First National Studios for his method of dubbing, in which the level of the dialogue automatically controls the level of accompanying music and sound-effects; to Douglas Shearer, A.S.C., and the Metro-Goldwyn-Mayer Sound department for their automatic control system for cameras and sound-recording machines and auxiliary stage equipment; to Electrical Research Products, Inc., for study and development of equipment to analyze and measure flutter resulting from the travel of film through the mechanisms used in the recording and reproduction of sound; and to Maj. Nathan Levinson, Director of Sound Recording

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at Warner Bros.—First National Studios for the method of inter-cutting variable density and variable areas sound tracks to secure increase in the effective volume range of sound recorded for matian

pictures. Several of these achievements have already been described in these pages to readers of the American Cinematographer, and descriptions of the others are planned for the near future.

Problems of Controlling Correct Photographic Reproduction

Continued from page 142

pressing green-yellow radiation. The spectral transmission curve of such a filter is closest in shape to the spectral sensitivity curve of present Panchromatic supersensitive emulsions, both showing their maximum peaks in red and blue.

Viewing an object through this type of filter will enable one to visually anticipate the effect of the spectral reflection characteristics of the object upon the negative material before exposure. Thus we are able to construct visually for any object what was previously referred to and explained as the photicity curve.

Bath types of viewing filters discussed are helpful in many ways for each problem, that of "Orthochromatic reproduction" and deliberately distorted reproduction.

An interesting field in which the application of photographic distortion plays

an important part is in the photographing of so-called "effect shots". This includes the many different methods of composite trick photography wherein the combination of foreground action and background is achieved by utilizing the possibilities of color enhancing and depressing filters.

Also, in this category belong photographing through haze and photographically producing night effects made in the daytime. While both of these tasks can be accomplished quite successfully by using Panchromatic negative emulsions in combination with red filters, there are also available special emulsions which in addition to the blue sensitivity inherent to silver bromide, are sensitized for deep red and infra red radiation, and thus make effects possible which cannot be obtained otherwise.

The next article will conclude the se-

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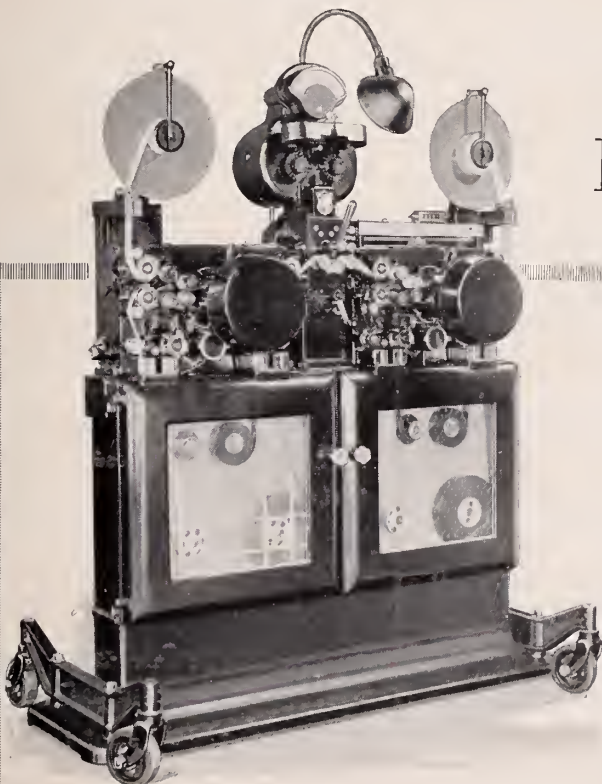
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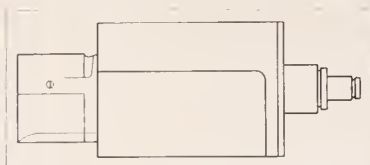
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Absolute Music by Designed Sound

Continued from page 148

the way, in the "March-Trot" of Rimsky-Korsakoff and Sholpo).

All the possibilities of quarter tone music, of the performance of music of any nationality in its original form, etc., of course remain open.

Music acquires unheard-of force of action.

Furthermore, a chord of more than ten sounds per second can be heard distinctly only by very few musicians possessing an absolute ear. Very well, then! Let us turn it into a new timbre. The regular timbre complex (the basic tone plus the over-tones) reproduces in the miniature the full chord, not only statically but also dynamically. (At each of its notes, the over-tones repeat a certain musical phrase). Here is, therefore, a new path towards purely organic experimentation in search of new timbres.

One more thing. Music can be determined in regard to five relationships: pitch, loudness, technique of performance, timbre and polyphony. In regard to the lost relationship, "designed sound" will apparently be greatly helped by constantly improving the technique of the "re-recording" of sounds. By means of special apparatus for "re-recordings," done purely electrically without any acoustic hindrances, all the sounds are re-recorded upon one phonogram of normal width.

Some day perhaps, by means of re-recording, "designed sound" will enter into the regular symphony orchestra. It might enter the orchestra either as an unusual "soloist," or as a modest incognito, instead of some instrument which in its normal state can not fulfill the desires of the composer (see the use of harps in Wagner's music).

"Designed sound" permits combinations of any timbre with any method of producing the sound. The piano will be able to sing; the flute will ring like the plucked instruments. . . . Mr. Disney, can you imagine meowing in the voice of the

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dog, or barking in the voice of the cat? Can you imagine the tune of a French chansonette sung in the timbre of a roaring lion? "Synthetic" singing (without words) is not far off.

As far as speech imitation is concerned, its realization will involve probably more time. Even in regular sound recording, music, thus far, gives better results than speech. The choirs of the angels need not fear unemployment as yet. For the multiplication film, however, there is a possibility of smooth, unnoticeable transition from the timbre of the human voice into a melody of musically fixed tones, from musical tones into noise-like sounds and vice versa, as a combination of music and noise. Finally some voices, such as the natural barking of the dog, will be reproduced in the near future. The dog's voice vibrates an octave that makes the "bark."

It is curious that work on the analysis of the phonogram has originated in the Soviet Union not only in the fields of cinema or the radio (where a small group of people has also been working on "designed sound") but in purely musical circles. The State Music Publishing House has recently brought out in book form a posthumous work by Prof. Rabotnov—"A Treatise on the Investigation of Phonograms," dealing with vocal parts in particular. The work is devoted to the analysis of the disk records for the phonograph. Prof. Rabotnov analyzes the forms and conditions of the origin of the little furrows characteristic of the vocal parts. Prof. Rabotnov has accomplished that, of which once upon a time, Mogali-Nagi, the photo-innovator, dreamt.

From the literature on the subject, it is known that researches dealing with vocal parts were carried on in England a few years ago by Mr. Humphreys for the practical purpose of adding sound to films. Unfortunately, however, results of his work, have not as yet been published.

Most difficult to reproduce is the human voice with its sounds passing from one into another, and the singing quality of the violin. The striking of the bow upon the strings calls forth such a number of overtones as is impossible to produce in some other mechanical fashion.

Where can "designed sound" be heard? It is included occasionally into the broadcasts of the Leningrad radio-stations. Special little films with "designed sound" have just been made for Soviet television. The experimental radio-station in Moscow, which after midnight (Moscow time) transmits occasional television programs, is soon to include in its programs small multiplication films accompanied by "designed sound". The first number is the "March of the Chess Figures" with music from Carmen.



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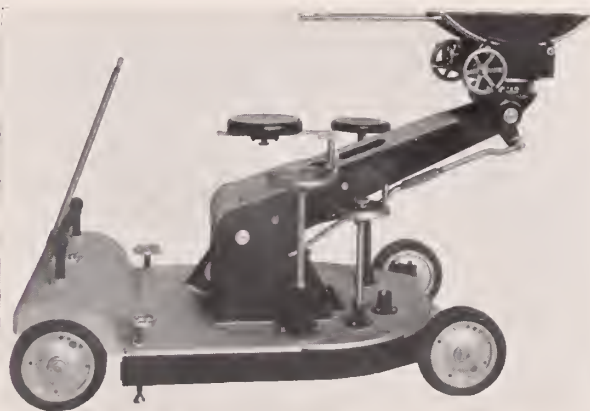
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Premier Changes

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Mole-Richardson "Ultra H. I. Arc."

A radically new high intensity arc spotlight, known as the "Ultra H. I. Arc," is announced this month by Mole-Richardson, Inc. Embodying the same exclusive "marinc-lens" optical system that won the (incandescent) Solarspot lamps immediate popularity, the "Ultra H. I. Arc" is a 150-Ampere High Intensity rotary carbon arc spotlight. In construction and appearance it is closely similar to its companion unit, the 120-Ampere "H. I. Arc". Like the "H. I. Arc", the new unit eliminates the uneven light distribution common to all reflector-arc spotlamps and delivers vastly more light than is possible with lamps using conventional types of condensing-lens optics. The projected beam from the new lamp is devoid of "hot rings" "dark centers," and element-shadows. The new unit's range of beam adjustments is from a tight spot-beam of less than 10° to a flooded spread of over 48°. At all focal adjustments greater than 18° the "Ultra H. I. Arc" throws a beam of much greater intensity than that of a comparably powered 36" Sun Arc.


The steadiness, silence and color-distribution of the new lamp mark definite improvements over previous types. Over a twenty-minute burning period, the intensity of the "Ultra H. I. Arc's" light will not vary plus-or-minus 5%, while sound experts have pronounced it possible to use the lamp within ten feet of the microphone. While the new lamp was developed primarily for Technicolor photography, and received its first practical use on "Dancing Pirate," it is, like its predecessor the "H. I. Arc," finding extensive application on black-and-white sets where light-effects, strong source-lighting, etc., call for a high-powered, modern arc.



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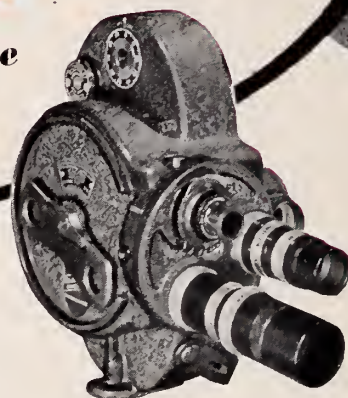
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use with color film. • The 121 operates at two speeds, 16 and 24, and makes single-frame exposures. It has both waist and eye-level viewfinders, a built-in exposure calculator, accurate film footage indicator, and an attached non-rotating winding key which folds flat against the camera. • The 121 is unique among 16 mm. cameras in its combination of precision manufacture and compactness. Price, only \$72.50.

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AMATEUR MOVIES

APRIL,
1936

this issue

A Continuity for Easter
Explaining the Laws of Symbolism
Simple Filtering Is Best
Filming the Quintuplets
Editing Is Really An Art
... and other features

25c





PLENACHROME FOR SPRING

SPRING heralds the opening of a new deluge of advice to motion picture enthusiasts.

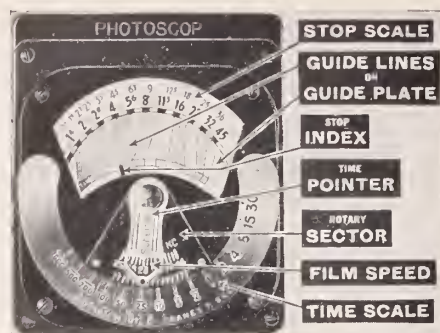
From all sides you are admonished as to what pictures you should take, how and when to take them. You are showered with advice . . . helpful, of course, but . . . don't lose sight of the fundamental fact that the quality of your movies is governed largely *by the film you use!* . . . And since spring calls for an ideal all-around outdoor film . . . a wise choice is Agfa 16MM Fine-Grain Plenachrome Reversible Film.

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The time scale is calibrated from 30 seconds to 1/1000 second and from 8 to 96 frames-per-second for cine cameras. Film speeds from 14 to 29 are included. The stop scales have all English and Continental stops from f1 to f45. The new PHOTOSCOP will function under every adequate condition of daylight or artificial light in which the vast majority of pictures are made, with all popular types of amateur films from the slowest to the most ultra sensitive.

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The meter is held breast high; aimed as naturally as pointing your finger, and read by looking DOWN on the scale in the natural reading position. There is no inconvenience to those who wear glasses.

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AMATEUR MOVIE SECTION

Contents . . .

A CONTINUITY FOR EASTER By Borry Stoley.....	164
EXPLAINING the Laws of "Symbolism" By Max Liszt.....	165
THE SIMPLEST Filtering is the Best By Wm. Stull, A.S.C.....	166
EDITING Is Really An Art By J. Belmor Holl.....	167
FILMING the Quintuplets By Doniel B. Clark, A.S.C.....	168
HERE'S HOW By A.S.C. Members.....	169
I REMEMBER Way Back When By Charles Rosher, A.S.C.....	170
WHEELS of Industry.....	171
ENLARGEMENT of 16mm Film By R. Lumley.....	172

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Next Month . . .

• A timely article on Kodochrome. And, of course, a good continuity. One of the prominent directors of photography of Hollywood will give you some technical information. J. B. Holl will continue his discussions on composition.





A Continuity for Easter

by
Barry Staley

EASTER—with its chicks and bunnies and bright-hued eggs! Surely this year you will film a record of the family's Easter activities. By capturing the spirit and events incidental to the day, you will make a valued addition to your celluloid domestic album.

The following outline scenario will also give you exercise in operating your camera to catch natural rather than posed or directed action. Particularly with children, this unhampered flow of natural gesture, expression and motion has priceless warmth and charm. It is not always easy to get, but is a treasured possession when finally unfolded on the screen.

MAIN TITLE: OUR EASTER PARADE, 1936.

SCENE 1: CLOSE-UP of Junior having his ear roundly soaped and washed.

SCENE 2: CLOSE-UP of Junior having his hair combed and nicely slicked down.

SCENE 3: CLOSE-UP of Daughter's stockinged feet only. She draws on her new shoes.

SCENE 4: CLOSE-UP of Daughter's head only. Her curls are being brushed tight.

SCENE 5: CLOSE-UP of Mother opening a hat box. She lifts out her new Easter hat.

SCENE 6: CLOSE-UP of Mother seated at dressing table. She puts on the hat, adjusts it to the right angle, admires the effect.

SCENE 7: CLOSE-UP of Father's hands folding a new clean handkerchief.

SCENE 8: CLOSE-UP of Father patting folded handkerchief into breast pocket of his coat.

SCENE 9: MEDIUM SHOT of the family front door. It is closed but it opens and the family step out through it one by one arrayed in their full Easter splendor.

SCENE 10: MEDIUM SHOT of the entire family as they reach the sidewalk and join the Easter parade to church. FADE OUT.

SCENE 11: FADE IN on SUB-TITLE: EASTER RABBIT AND THE EGG HUNT.

SCENE 12: LONG SHOT of the back yard. A white Easter bunny is scampering about the yard.

SCENE 13: MEDIUM SHOT of the rabbit hopping over the lawn.

SCENE 14: CLOSE-UP of the rabbit munching at a blade of grass. Note: These rabbits are so tame you can with reasonable patience catch him sitting up nibbling at grass and wriggling his ears in manifest enjoyment.

SCENE 15: MEDIUM SHOT of the rabbit. The children run in and after more or less pursuit catch him.

SCENE 16: CLOSE-UP of Junior holding the rabbit, stroking the long ears.

SCENE 17: MEDIUM SHOT as Mother enters the group about the rabbit. She gestures to various points of the yard. Children dance away as the Egg Hunt is on.

SCENES 18 to 25: CLOSE and MEDIUM SHOTS of the children, their faces beaming with happy delight, as they scurry about the yard in quest of the hidden Easter eggs. Don't pose or rehearse these shots. Take a central position with your camera and catch the children's own natural expressions and actions. They have their own inimitable ways and personalities.

SCENE 26: CLOSE-UP of a colored Easter egg in its little grass nest hidden in a hedge.

SCENE 27: MEDIUM SHOT of Junior, hot on the trail, nearing the hedge.

SCENE 28: CLOSE SHOT of Junior as he spies the hidden treasure and proceeds to annex it.

SCENE 29: CLOSE-UP of the hidden Easter egg. Junior's hand comes in and takes it away.

SCENE 30: MEDIUM SHOT of Junior as he joyously announces his find and clasping it proudly displays it for general approval.

SCENE 31: CLOSE SHOT of Junior, firmly clutching his Easter egg, as he valiantly carries on the hunt.

SCENES 32 to 40: CLOSE and MEDIUM SHOTS from varying angles of the children pursuing the hunt and discovering the hidden Easter eggs. The scampering Easter rabbit is frequently in evidence.

SCENE 41: CLOSE-UP. On the children's table, taken to the yard, is an Easter basket now piled high with Easter eggs. The tiny hands of Junior and Daughter come in and add the final eggs to the colorful collection.

SCENE 42: MEDIUM SHOT of the children drowing chairs to the table and hopping into them.

SCENE 43: CLOSE SHOT of the children at the table, cracking the shells and removing the outer covering from the hard-boiled eggs.

Continued on page 180

Explaining the Laws of "Symbolism"

by

Max Liszi**Director of "Lives Wasted,"
a "New Film Group" Studios Picture

FROM THE TIME that "man" first began to think he has always tried to present his surroundings by words and pictures which were a reproduction not only of what he saw but also of what he thought. What he saw was quite easy to describe, but what "man" thought was often quite difficult to express and he had to make comparisons, had to call in things that he had seen previously in order to describe his thoughts, and "Symbolism" (the art of describing one thing with the aid of another, sometimes entirely foreign, substance) was born.

Through the ages "man" has developed "symbolism" until in this present day "symbolism" has been developed to such an extent that it tends to become over-developed and therefore confusing and defeating its purpose.

This is very much true to a very great extent in our present-day motion pictures, and well for the reason that the users of "symbolism" in their pictures try to out-symbolize one another and disregard the laws of this means of expression. They try to beat one another in very much the same way that the studio publicity man tries to beat his rival studio in the use of superlatives in his description of a picture, disregarding entirely the picture's contents and merely concentrating his brains on the invention of still greater superlatives. This, of course, defeats its own purpose.

The same applies to the directors who have done a good thing to death by their hit-or-miss methods, disregarding entirely the laws of "symbolism" until now many have come to look on this phase of picture-telling as something "arty" that the public does not appreciate or understand anyway. This is a very foolish stand to take inasmuch as nothing is used so much in every day life as "symbolism," inasmuch as this form of expressing one's thoughts is understandable and normal to every person.

But, as with everything else, one has to know on what fundamental laws picture-symbolism is based, and failing to have this knowledge at his command naturally one is apt to commit mistakes in its application and thereby defeat its purpose.

The very first law is: Symbolism must be universally understood. By that I mean that it must be as clear to Americans as to Chinese, Eskimos, Negroes, etc. For example: In symbolizing the death of a relative or dear friend we wear a black ribbon on our coat sleeve; but in China the person wears a white ribbon inasmuch as there white is the color of mourning. If in our picture we would symbolize death by the color black this would not be understandable to the Chinese and its significance would be lost to them and therefore the picture would suffer in its clearness of story telling. In order to assure our picture the appreciation of the world's audiences we must employ a "symbolism" that is universally understood as, for example, a wilted flower.

But law number 2 decrees that: Symbolism must be kept in the mood of the sequence. By this is meant that in symbolizing the death of a big, strong man it is unforgivable to employ a little wilted flower inasmuch as the "mood" of "big strong man" is antagonistic to the "mood" of "little wilted flower." Therefore we cannot use a flower in this case, but we can use a sturdy oak tree broken in two. In this the mood of the tree is akin to that of the man inasmuch as both are big and strong and the spectator will readily accept this and recognize it as it is in keeping with his mental picture of the big man he saw on the screen before.

The third law demands that: Symbolism must utilize an object familiar to the locale of the sequence. This is a very important law and one that is most broken. If our man (see 2) is a farmer, the symbolism of the tree would be correct as trees are familiar objects in the locale of the man; but if the man were an office worker in a big city of buildings the tree-symbolism could not be used very well inasmuch as the tree would be foreign to the locale of the office (buildings) in the city and therefore the tree cannot be used in this instance, but we must use an object that is familiar to the city-locale as for instance in this case would be a broken and burned-out pipe.

This brings us to law number 4 which decrees that: Symbolism must be recognized and understood at first glance. Meaning that the audience must readily understand the "symbolism" used and not have to think for a while before it catches on to the meaning, and this for a very important reason. Suppose it would take the audience ten seconds to get the meaning of the "symbolism" used on the screen. During that time fifteen feet of film has passed through the projector, fifteen feet of story-telling (action and dialogue) have passed and, may be, a very important point in the story has been told, but the audience is still thinking about the "symbolism" and therefore unconsciously pays only little attention to the screen so that when they finally do get the meaning of the "symbolism" and their mind is ready again to follow the picture they have lost the point that was brought out during those fifteen feet and are therefore unable to enjoy the development of the picture because a link is missing in their mind. This irritates the audience and the result is that, when asked his opinion regarding the picture the spectator will give an adverse verdict which will tend to discourage the questioner.

If the applied "symbolism" does not obey these four laws it is best to kick it out of the picture.

Let us analyze the following "symbolism" used in a picture here in Hollywood some time ago. The scene was as follows: Two men are seated at a table in a room which is lighted by an electric bulb suspended on a wire from the ceiling. They are drinking wine poured into glasses by one of the men. Suddenly a fight ensues between the two. During the fight the pourer of the wine is stabbed and the other man jumps back, now standing against the wall with his back while the stabbed man is dying.

In order to symbolize the dying of the man the director did as follows: The burning electric bulb on the wire from the ceiling was swung pendulum-wise, causing the observer's (not the dying man) face to be alternately lit up and plunged into darkness. The swinging slowly decreased until finally the burning bulb hung motionless from the ceiling.

This "symbolism" was poorly chosen and incomplete, for the following reason: It did not obey all four laws, and "symbolism" must do that in order to be successful. It broke

Continued on page 178

The Simplest Filtering Is the Best

by
William Stull, A.S.C.

A CINEMATOGRAPHER'S assortment of filters should be the product, not of accumulation, but of elimination. The really important thing about filtering isn't how many filters you have, but how intelligently you use them. As a rule, the fewer you have, the more wisely you learn to use them. The Wratten filter-catalogue lists well over a hundred different filters; and I have known professionals who packed over 200 filters in their accessory cases; but when it comes down to practical picture-making, even the owners of these imposing filter-kits find that they can meet the requirements of almost any imaginable scene with a set of but three or four simple filters.

The first step in simplifying the filter problem is fitting your filters to the film you use. If you use Orthochromatic or Plenochrome films, you won't need the filters made to use on Panchromatic materials. In the same way, if you use either regular or Super Pon, the filters made for Ortho will be of little or no value. If you use Super Pon, the film itself will eliminate the need for some of the lighter filters you would use with regular Pon, while for heavier filterations, you will need filters heavier than those used on ordinary Pon. In any case, three filters, or perhaps four, will give you every degree of correction you'd normally want.

Let's say you use Ortho: this type of emulsion begins to grow blind somewhere between the green and the yellow parts of the spectrum. (Plenochrome pushes this limit farther through the yellow toward the orange and orange-red, but it is still in the orthochromatic category.) So all you'll need will be yellow filters; the orange and red ones would be useless. Therefore your filters should be yellow, and to give the different degrees of filtering you want, they should be of varying densities. The best filters for use with Ortho, then, are the K-1, which is a light yellow; the K-2, a medium yellow; and the K-3, a deep yellow. They will give you a light, an intermediate, and a heavy correction.

If you use regular Pon, you have a film which, unlike Ortho, is quite sensitive to the red end of the spectrum. Accordingly, you will need three types of filters if you want a full range of filter effects: a yellow filter, for mild correction; a yellow-orange one, for the intermediate effects; and a red one for heavily over-corrected shots. Probably the best trio for this type of film would be the K-2, for the mildly filtered shots; the G, for intermediate effects; and one of the red filters—23-A or 25-A, according to your taste—for the heaviest corrections.

Supersensitive Pon begins by giving you a film which incorporates a correction approximately equal to that of



At top: Girl with red dress, super film, no filter.
Bottom: Same, but using 25-A filter.

the K-2 on ordinary Pon, so you will have to move several steps down the line. The K-3 is a good starting-point; the ideal intermediate filter is again the G; and for the heavier over-corrections, you can choose between the 25-A filter and the 29-F—the latter only if you want the very heaviest over-corrected effects.

Now, just what do we mean by these terms "mild correction," "intermediate correction," and "over-correction"? Simply this: that no type of film yet used has seen colors in exactly the same scale of brightnesses that the eye does. Therefore, we "correct" the film's rendition of the scene with filters which alter the way it sees—and reproduces—the colors. A mild correction will improve things generally, though not, as a rule, making things reproduce in black-and-white in entirely the same relative values we see. An intermediate correction would bring things just about to the relative brightnesses we see—possibly overdoing it a bit. And over-correction simply means that the filter exaggerates things, making the film reproduce things for differently from the way we see them, though in a way that may be highly effective as a picture.

In landscape scenes, our correction has chiefly to do with making the scenery, the sky and the clouds stand out from each other, though actually, filter-correction has an important bearing on the way the various greens of foliage, etc., appear on the screen, as well. Disregarding the latter, however, with most of the familiar types of film the blue sky photographs pretty light—a light gray, or even white, depending on the weather and the type of film used. Against this background, the white clouds lose themselves pretty completely. Often, too, the all but imperceptible atmospheric haze will screen the distance, and we will have no

Continued on page 178

Editing Is Really An Art

THERE IS ALWAYS a definite reason or purpose that binds all Art Forms together into harmony, and the cinematographer must know in advance how his shots are going to fit into the finished film. The proper balancing of all the elements that have gone into the picture will result in having the rhythmical harmony that takes the picture out of the commonplace.

The problem of the designer is to relate forms into space, some of which are static and others that are mobile. The standard of art depends largely upon the image-film of our eye and the method in which we express it in one art form or another. The cinema being the most mobile art form, requires a greater sense of timing than any other art form. The lighting changes from one scene to another compel the editor of cinema to consider lines, words, and music into a whole. The action must always leave the observer with the feeling of perpetual motion, that each scene flows into a perfect rhythm.

There is always a definite reason or purpose which binds together a series of thoughts or events. Any avoidance of this will create a jumble of scenes and their relation to one another will be lost. The cinema unites thought and expression so that the story being told is in complete continuity.

The many methods that proper timing is arrived at depend entirely upon the editor, who has the many devices such as the lap-dissolve, fade, (in or out), the wipe, or the simple cut-back. If the transitions are smooth the timing is smooth, thus bringing about the perfect continuity.

Editing does not mean the patching of sequences together as they were shot because the exact amount of footage down to the last frame is important. If it were otherwise a film would be only a series of shots, arranged together and would not have unity. If we wish to link together two different views of the same shot we must make them proceed logically out of one another.

We introduce a man sleeping on the ground shot as a semi-close-up; suppose the action calls for some noise that awakens the man, a bird in the tree, then we cut back to the man's head as a close-up. If the bird was shot in telephoto it would be wrong. The reason is that the man has been seen as a large figure and that image is impressed on our minds so that the bird would lose its meaning, and the size relations would be too great. The right way to make this sequence would be to shoot a "cut-in" shot of a tree and in that way we have forgotten the size of the man, the tree would be impressed upon our minds and the natural thing to find in the next shot would be the bird on the limb. This will give us time to change our mind-image of the relationship of the man and bird without slowing up the action between the cut-in shot and the movement would be smooth and continuous.

In determining the correct "tempo" of one shot to another, one must always remember his audience's reaction. Hold the shot on the screen just long enough to receive the impression of its meaning but not long enough to analyze it consciously. We often see this on the screen and wonder why it is boring and artificial. Care should be taken not to overemphasize inanimate shots. The close-up is the best medium of the screen and the amateur is the one who leaves it out the most.

by
J. Belmar Hall,
Instructor Cinematography, U.S.C.

Most amateurs do their own cutting and editing, so the control is in one hand, which is as it should be, but most times the script has not been prepared carefully. Each shot must be thought out before shooting, the exact number of feet each scene will have, the angle of the camera, the long shot, (this is to establish locale), the lens as an independent observer, the lens as the eye of an actor, panning, speed of the camera, (this is for any change other than normal), the fade-in or out, etc. The best fade is the chemical fade as the exact length can be determined to the very frame, which will give smoother rhythm.

The dissolve has to be detailed as to length. Dissolves slow the tempo and cutting is sometimes better. Wipes can be used to quicken action of one scene to another. Masking is very important, as are all other effects for proper timing and continuity. Montage, or mounting is thought out before the shot is made, the cinematographer must be able to translate words in the script into picture-images so that he will at all times know how they fit in. The next step is the proper selection of locations as they fit into the composition for their story-telling quality. Composition is the most important thing in visual art and if the action is bad at times the composition will save the shot.

Unity is the very life of cinema. Each sequence is related to one another. The tonal values that are in the photography will be lost if the cutting is jerky, the proper timing of all camera tricks must be only for their importance to the story, otherwise fades will be too long or short; dissolves that are not timed properly will be meaningless. When there is a "pan" shot it must never be cut in to some scene where the action preceding has been moving in the opposite direction.

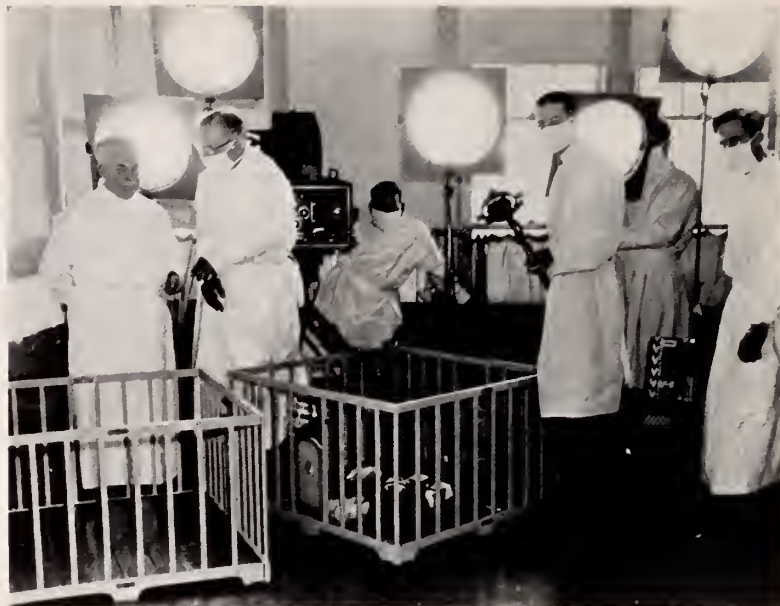
The question of titles in the silent film has to be well planned. In fact, if you can let the action tell the story, do so. Titles at their best, are the one sure way to break the continuous flow, or rhythm.

After your picture is ready for the cutting table be sure and have everything needed and in its proper place. Each scene should be marked in some way. Cut in your scenes in their relation to the story and don't try skipping about as you will find you will have scenes in that should never be used, and you may be repeating scenes; also it is important to have copy of the finished script at hand so that you are not just trusting to memory. Check each scene as complete when it is attached and go on to the next, proceeding this way you will save time.

After you have finished the first cutting, project and make notes for any other changes. You will not be able to cut in your scenes and just let it go at that. Every film can be re-edited many times before it is ready for screening as a finished picture. Where you have many scenes around the same subject, you will find by transposing them in different sequences that it will change your story value. It can add or harm the visual rhythm and make or mar your picture.

Filming the Quintuplets--and Your Baby

by
Daniel B. Clark, A.S.C.



The actual set-up for shooting the quintuplets, with Cinematographer Clark in the background next to the camera. Note that there is no glare from the lamps . . . text tells you why.

THE BIGGEST PROBLEM in getting good baby pictures is the man at the camera. A baby—any baby—is a natural actor: as long as you let the baby be himself in front of the camera, you are sure to get scenes that will appeal to any audience. Only when your adult mind steps into the picture, and you try to gild the lily, will you find baby filming becoming a problem. The first, last and only rigid rule for getting good stills or movies of babies is to keep everything connected with the picture-making as simple and natural as possible; keep away from camera tricks, and don't try to "direct" the youngster. Whatever the result may be on the screen, it can't help being natural and pleasing!

This was very forcibly brought home to me in my experience photographing the Dionne quintuplets for "The Country Doctor." It was absolutely impossible to bring the "quints" to the studio in Hollywood, so a skeleton unit of us were sent up to Collender, Ontario, to film the scenes in which the babies appeared. Moreover, Dr. Dofoe and the quints' guardians very rightly insisted that none of our picture activities should in any way interfere with the babies' daily routine. And all of us, from Mr. Zanuck and his executives down to the prop men and electricians, were resolved that nothing in our lighting, camera-setups, and the like should in any way endanger the famous babies.

Our first problem was lighting. Our scenes were to be photographed in the quints' own nursery, so we would have to use artificial lighting. Of course, there must be a certain amount of light to give us a satisfactory exposure—but the light could not be so intense that it would injure the babies' eyes. As the room was relatively small (about 17 feet square), we would have to use compact lighting units.

Long before we left the studio, Camera Executive Godfrey Fischer, Walter Strohm, the studio's chief engineer, and I made a series of tests. With the help of babies the same age as the quints, we tested every imaginable type of lamp, light globe, and diffuser until we had a light which, while it gave plenty of light for good photography, bothered the babies so little that they did not even notice when the lamps went on or off.

The units we finally selected were the Mole-Richardson "Cinelites" and "Photolites". The "Cinelite" is a remarkably compact floodlight unit which uses the big No. 4 Photoflood globe. The "Photolite" is a smaller unit using either a 500-Watt clear globe or a small Photoflood; as it has

a highly polished chromium-plated aplanotic reflector, it throws a "harder" beam. Our lighting equipment consisted of six "Cinelites" and two "Photolites". That was all!

But good lamps, alone, would not answer the question about protecting the babies' eyes. A Photoflood—even the big No. 4, which is photographically two and a half times as strong as a standard 1000-Watt globe—may not be as hard to look into as a studio-type 5000 or 10,000-Watt globe, but it is quite enough to trouble a baby's eye! What we had to do was to soften the light to a safe point, while yet keeping enough for good camera work. The solution was to screen our lamps with translucent gelatine diffusers—No. 52 Cinema Daylight Blue, to be exact. This is the same diffuser which John Seitz, A.S.C., (who also photographed several of the film's studio-made sequences) uses so successfully in photographing Shirley Temple. When we exhibited our battery of lights to Dr. Dofoe, both he and the newsreel and newspaper photographers assigned to the quintuplets declared that the lights were ideal for lighting babies, though they could not believe there was enough light for good camera work. But there was: in fact, on many shots, we did not have to use nearly all of our lamps! And as for safeguarding the quints' eyes—well, before we left, Dr. Dofoe insisted that the official newsreel and "still" photographers duplicate our lights, even to the diffusers.

When we reached Callender, we learned we would be allowed to photograph the quints exactly one hour each day. This was during one of their play intervals, between the morning nap and lunch time: from eleven A.M. to noon. If the babies happened to be delayed in their baths and other morning duties, it was so much the worse for us; their lunch time was 12:00 noon—and that didn't mean 12:01!

With so short a time for shooting, we naturally tried to make full use of every second. Well before the appointed time, we would be set up and ready to go. Director King and I would have planned out the angles we wanted ("hoped" would be more like it!) to get. The camera and lights would be set up. We ourselves would be ready—thoroughly disinfected and clad in surgeon's gowns and masks. Incidentally, only a fixed number of people are allowed in the room with the babies at one time; we kept

Continued on page 176



HERE'S HOW

by A. S. C. Members

Will you please arrange to give the answers to the following questions about animated cartoon making on your page, "Here's How"?

1. In animated cartoons, if we want to show a subject approaching the camera, how are we to do it? By bringing the camera nearer the drawing? If it is done in this way, will it not affect the relative perspective of the picture; being better when the camera is at a distance? How is it done in ordinary pictures?

2. In an article it is said that celluloid pieces should be used to draw the pictures for animated cartoons; but the celluloid pieces being glossy, they don't take ink. If they are semi-matte finished on one side, they will be translucent, and not transparent. What ink should be used? Washable? Or permanent? Can you say which is the best celluloid for the purpose?

3. How is a "pan" taken in animated cartoons?

4. How is the sound dubbed in on animated cartoons?

5. Will the photographic value of a cartoon increase if we use diffusing-screens?

—K. A. J., Poona, India.

1. In normal photography, if we want to show a person approaching the camera, we can naturally have him walk right up to the lens, and if we want the camera to approach him, we can roll it toward him on a wheeled carriage. In animated cartooning, while we can, in some photographing installations, move the camera toward the drawings, it is much simpler all around to keep both the camera and drawings stationary, and to show the apparent movement by drawing it, just as we would draw in any other motion. Suppose, for instance, we have "Mickey Mouse" standing in the middle of a road, and want him to walk toward the camera: we simply draw him stepping forward—just as we would draw any other animation—but each drawing must show "Mickey" a tiny bit larger than the last one, for on the

screen, size is the indicator of an object's apparent nearness. As the background remains the same, by the time "Mickey" has walked forward until his size is doubled, he will apparently have come twice as close to us as he was when the action began. If, on the other hand, we want the camera to approach "Mickey", we need not draw a walking motion for "Mickey", but a simple series of pictures in which he grows larger in the same progression. Instead of holding the same background, we animate the background; in this case, progressively altering both scale and perspective, and making the fence-posts, telegraph poles and trees at the side of the road move toward the edges of the picture and grow larger, until they apparently come so near the lens that they are no longer included in the view. It is important, of course, in this sort of action, to take care that we don't let the roadway appear to slip forward under "Mickey's" feet.

2. If your celluloid is good and clean, almost any good waterproof ink will "take" satisfactorily. In my studio, we always wash new "cells" carefully before using them. As to materials, it is hard to advise you as we don't know what is available to you there in India; but Higgins' waterproof black ink and DuPont celluloid are always satisfactory.

3. A "pan" in an animated cartoon is simply made by using a long background, which is moved a definite distance to right or left between each exposure. If we want to "pan" to the right, the background moves to the left, and vice-versa. The background is usually drawn on paper; and if "Mickey" is to be "followed" by the camera during the "pan", "Mickey" is drawn in the usual fashion on "cells", animated in a regular walking cycle. Thus, "Mickey" will appear to walk, though staying in the center of the frame, while the background moves across behind him, exactly like a normal "panning" shot.

4. A thorough discussion of how cartoons are sounded would take up much more space than the editor would allow here; besides, I believe it has already been covered in one or more earlier articles. (See February, 1935, Page 76.—Ed.) To put it briefly the music and the drawings are planned together; the music is specially written for the picture. We have two fixed units to work with: the BAR of music, and the FRAME of

picture-film. In preparing the scenario, we know how much film—and hence how many frames—each scene will be given. Thus, knowing the tempo of the music planned, we can accurately foretell that when bar No. so-and-so of the music starts, frame number such-and-such will be on the screen. The music is then recorded, carefully timed so the tempo will be right, and the drawings made and photographed. When the two are completed, they must inevitably synchronize. All that remains is a routine job of re-recording or (if there are no sound-effects or dialogue to be added) merely printing the sound-track onto a single composite print with the picture.

5. I do not believe that there would be any benefit in photographing animated cartoons through a diffusing-screen. Quite the reverse, in fact, for a fuzzy, soft-focus cartoon is definitely unpleasant on the screen, and its action is hard to follow. Cartooning is one phase of cinematography where sharp, precise focus is still a vital necessity.

—Walt Disney.

I have done much experimenting with Max Factor's Panchromatic make-up. I would like to know if professional cinematographers make any allowance for the difference between Mazda and daylight illumination. If so, what filters are used, or what change in the Panchromatic Make-up is made?

—R. V. C., New York City.

Very few of the A.S.C. members compensate for the difference between Mazda light and sunlight, except where some particular condition may make it necessary. Between the color-sensitivity balance of modern film, and the care with which modern make-up is coordinated therewith, such compensation, while it might be advisable in theory, is rarely necessary in practice. Max Factor's experts point out that their Panchromatic make-up is planned to give the face a uniformity of coloring which to a great extent makes such compensation unnecessary. In practical terms, one is quite safe in forgetting the chromatic differences between sunlight and Mazda light if the make-up is properly applied. If however, you want to be scrupulously accurate, use on Aero 1 filter on exterior scenes.

—Wm. Stull, A.S.C.

I Remember Way Back When

by
Charles Rosher, A.S.C.

IN THE YEAR 1911, William Howard Taft's ample avoirdupois was overflowing the Presidential chair. Ladies' skirts swept sidewalks clean. Tightly-laced armor-plate casements imparted hour-glass proportions to their figures. The Gibson Girl was hat stuff. College boys needed hair cuts, sported underslung pipes, bulldog shoes and peg-top pants.

The delightful word "saloon" embellished building facades at frequent intervals. Between punctures, daring prophets averred the auto was here to stay. Los Angeles real estate let their enthusiasm run riot to boast their city would one day reach half a million souls. Animated pictures were flickered at the swankier nickelodions. A few enterprising vaudeville virtuosi went so far as to include a reel in variety bills, but deep thinkers as a rule, preferred the acrobats.

Hollywood was a hope, albeit a thin one, and not a mental condition. It consisted of wide expanses of landscape in amazing variety, a few cow-barns and sheds, considerable sunshine and a band of brave men who were gambling their all in the accouchement of a great industry.

Following happy years of portraying crowned and titled heads of Europe—there were more of them to photograph in those days—as associate of Richard Speaight, the Court Photographer of London, the Spring months of that year found me in Hollywood. Love for travel, incurable curiosity, a spirit of adventure, impelled the visit.

Those two film-pioneering Englishmen, David and William Horsley, had founded Nestor Films, later to become the nucleus of Universal. I spent an afternoon in pleasant conversation with them. Leaving their bleak quarters, I was approached by their general assistant. I suppose he was one of the first of a long line of future Production Managers.

"So you're a camera man?" he challenged.

I confessed to being a photographer by profession.

"Then let me see you thread that camera!"

I did so under his doubting, you've-got-to-show-me glare. This, I learned later, was the crucial test. One who could thread a camera was perforce a camera man. I had a job.

Not one Hollywood camera cranker at that era, myself excepted, was a professional photographer. One reason why so many of them fell by the wayside when photographic values became demanded in films.

I was given a camera affectionately known as Billiken. Its large wooden case resembled a lady's dressing case. It



was same two feet high and long, and about six inches thick. A carrying handle was at the top. A lone 50mm lens projected at the front. The mechanism, assembled by the Horsley Brothers, was a composite of component parts taken from many cameras. I recall it had a Gaumont sprocket and Williamsan-Beater movement. Magazines were inside the case. To fade out, you reached around in front and screwed the diaphragm closed, still cranking with the right hand.

We produced the stirring drama, one full reel in length, "The Indian Raiders." It was one of the earliest "independent" productions ever made in this country. For this epic, real Indians were imported all the way from New Mexico by Jack Parsans, who remained to establish the Western Costume Company.

Camera set-ups on location were established by the director moving about until the sun shone brightly over his right shoulder. Some would stand, watch in hand, timing the crank speed while a scene was being shot. An unfailing sixteen per second was the true test of a competent camera man.

First thing in the morning, I would load my own magazines. Following the day's shooting, I would take the film to a darkroom maintained in a cow-shed near Gower and Sunset, where the Christie studio later was erected. Here I would help develop the negative.

I was still photographer as well. When occasion required, a postcard size kodak was rented by the day and a roll or two of film purchased. The studio owned no still cameras, and the 8x10 negative had not yet come into general use. I would, of course, develop the rolls and later throw up enlargements to the desired dimensions.

There was no printing machinery here to handle motion picture film. The picture was cut directly from the negative with all hands helping. We thought nothing of running original negative through projectors. Scratches and other abrasions were a mere detail. The completed reel of cut and assembled negative was shipped off to Chicago or New York for printing.

Continued on page 174



WHEELS OF INDUSTRY

New Photocap

● The wide use of exposure meters within the past few years and the constantly improved designs always causes a stir in photographic circles when a new instrument is announced.

The recent release of a new model by Photocap through Photo Utilities of New York naturally caused much interest in this model.

According to the announcement of this concern the new Photocap is small enough to carry in the vest pocket. It comes with a handy carrying case. Merely the opening of a friction catch places the meter in immediate position for use.

This new model, like its forerunners, is based on the Scheiner degree rating. Its main claim for popularity is that it is possible to present both film speed and shutter speed and secure a direct reading of the lens setting without any further manipulation of the meter.

There is one scale for the Scheiner rating. This scale is first set, then the second pointer is set at the shutter speed or frames per second speed. The meter is now ready for direct reading so long as you are shooting that film and at the pre-set speed. You can shoot all day, all week or all year without a further setting if the same film and the same shutter speed is used.

However, the settings can be changed without any trouble for the use of different film or shutter speed. If you are shooting both a still and movie camera and you want to use the meter for both, it can be changed from one to the other and back again very quickly.

The placement of its photo electric cell is stressed by the makers of this meter. They remark on this point as follows:

"An ingenious placement of inclined photo-cell and mirror limits the angle of measurement to only about 45 degrees of practical photographic importance. The region directly in front and just below the horizon is favored. The 'top-light' influence is completely eliminated."

Many have felt that a meter with a large angle took in much more than is taken in by the lens and therefore might not give a true reading. Also the sky influence is constantly stressed. This meter places its cell so that it receives

the direct reflection of light from the ground, but the sky reflection is transmitted via a mirror, thus they claim, reducing its influence.

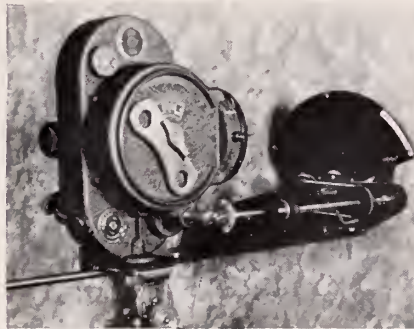
Reading can be secured in exposure time ranging from 30 seconds to 1/1000 seconds. Cinematic taking speeds from 8 to 96 frames per second. Film speed from 14 to 29 Scheiner and lens apertures from F/1 to F/45.

Film Catalog

● Mogull Bros., Inc., of New York City, announce a new catalog of 16mm Film Rental films. This catalog is available without cost, direct from Mogull Bros.

DuMarr for Filma

● J. D. Cochrane, Jr., now announces he has widened the scope of his DuMarr Radial Wipe by making it available for the Filmo 70D. Up until now it could be used on the Eastman Special 16mm and the Victor Model 5. This device permits the cinephotographer to make the professional type of wipe off and wipe on with his camera if it is any of the three makes mentioned above.



Improved Screen

● It is the claim of the Motion Picture Screen & Accessories Co. of New York City, that it has in conjunction with one of the leading textile mills of the country, so perfected its screen cloth that it will retain its basic white for a longer period and will continually project images with greater brilliancy.

Another improvement is claimed that will simplify the operation of the screen. The screen now raises automatically and instantly by merely lifting it up from the box.

Leica Exhibit

● Following is a schedule of the cities which the Second International Leica Exhibit will visit during the months of April, May and June. A special illustrated lecture will be given in each city.

Minneapolis and St. Paul—Dates: Thursday, April 2nd to Sunday, April 5th, inclusive; location, West Hotel, Colonial Room, Hennepin Ave. at 5th St.; hours, 11 A.M. to 9 P.M.; lecture, Friday, April 3rd, West Hotel, Moorish Room, 8 P.M.

St. Louis, Mo.—Dates, Thursday, April 9th to Monday, April 13th, inclusive; location, St. Louis Public Library, Art Room; hours, 9 A.M. to 5 P.M.; lecture, Saturday, April 11th, St. Louis Public Library, Assembly Room, 7:45 P.M.

Indianapolis—Dates, Wednesday, April 15th to Saturday, April 18th, inclusive; location, L. S. Ayres Co. Exhibit Hall, hours, 9 A.M. to 9 P.M.; lecture, Friday, April 17th, L. S. Ayres Co. Auditorium, 7:30 P.M.

Cincinnati—Dates, Tuesday, April 21st to Saturday, April 25th inclusive; location, Gibson Hotel, Club Rooms A, B and C, 10th floor; hours, 11 A.M. to 9 P.M.; lecture, Gibson Ball Room, Friday, April 24th, 8 P.M.

Columbus, Ohio—Dates, Tuesday, April 28th to Friday, May 1st inclusive; location, Southern Hotel, Mezzanine Lounge; hours, 11 A.M. to 9 P.M.; lecture, Hall, Thursday, April 30th, 8 P.M.

Pittsburgh—Dates, Tuesday, May 5th to Saturday, May 9th inclusive; location, William Penn Hotel, Adonis Room; hours, 11 A.M. to 9 P.M.; lecture, Cardinal Room, May 8th, Friday, 8 P.M.

Washington D.C.—Dates, Tuesday, May 12th to Saturday, May 16th inclusive; location, Willard Hotel, Bamboo Room; hours, 11 A.M. to 9 P.M.; lecture, May 15th, Friday, Willard Room, 8 P.M.

Baltimore, Md.—Dates, Tuesday, May 19th to Saturday, May 23rd inclusive; location, Enoch Pratt Library, Cathedral & Mulberry Sts.; hours, 10 A.M. to 9 P.M.; lecture, Enoch Pratt Auditorium, Friday May 22nd, 8 P.M.

Philadelphia, Pa.—Dates, Wednesday, May 27th to Thursday June 11th inclusive; location, Boyer Galleries, Brood St.



ENLARGEMENTS

OF 16mm FILM

The making of satisfactory enlargements from 16mm reversal film frames has been a problem to me. I have had a great deal of difficulty in getting the intermediate greys when making the enlarged negative, also the grain was too noticeable. When this negative was further enlarged onto bromide paper the grain and loss of detail was so bad that the whole process was not worth the effort. Here is a method that works very well.

Make your enlargements by reversal. Use Eastman Direct Positive Paper and the solutions recommended for it. An enlargement on this paper can be exposed, processed and dried in less than 5 minutes, as the paper is waterproof and the developments and reversal are very rapid. The exposure must be correct as there is no latitude, and no control during processing. Full instructions and formulas are included in each package of paper so it is not necessary to state them here. I have tried reversal with the usual contact and enlarging papers and they will not work. Here are a few hints that will help to insure your success with direct positives.

Use a series 2 safelight.

Give the paper at least a 20-second wash under a lively stream of tap water, after each solution used, to avoid contamination.

Direct positive paper comes in only two surfaces, semi-gloss and matte. Matte looks better for your album.

You will get a black border around your prints whether you like it or not.

Turn your white lights on when the negative image has completely disappeared in the bleach bath.

Don't forget to cover up your unused paper each time you remove a sheet.

Remember, that this process reverses the image from left to right, so it cannot be used to copy printed matter directly, unless a prism is used, or you re-copy the first reversal.

Figure 1 shows the result of under-exposure; figure 2, over-exposure. Correct processing was done in each case. Figure 3 shows the result of correct exposure and processing. Good enlargements from 16mm frames were the primary reason for my experiments with



All are enlargements made on reversal paper. Top is under-exposed; next over-exposed, and third from top correctly exposed. Bottom shows how these enlargements may be used for titling.

direct positive paper but there are other practical uses.

Figure 4 shows an easy way to make a personalized art title. Just clip a frame from the scene which is to follow the title, reverse it, title it and there you

are. Let's suppose we find a large illustration in a magazine which would make a good title background, but it is too large to slip into our titler. Photograph it on direct positive paper, letter it and you have your title card. Try composites by this method sometime, it will surprise you.

—R. Lumley.

British Institute Expands

During the few years of its existence the Institute of Amateur Cinematographers of Great Britain has had a phenomenal growth. Under the guidance of F. R. Chadwick, its secretary, the organization has not only increased its size, but has been an influence and a factor in things cinematographic throughout Great Britain. Since its inception it has had the support and encouragement of many in the professional movie studios. Alexander Korda has always lent it willing support.

It was not surprising that the organization should announce a widening of its by-laws so as to also make a professional part of the institute. To this end the name was changed to the British Institute of Cinematography. This new institute will be much broader in its scope, it will profit immensely from its connection with the active studios in London. The professional cameraman of London will be admitted to membership in a specially created class. The amateur will still remain a part of the re-organized institute.

We feel certain that the British amateur is appreciative of this move. He has always taken his photography and cine-filming very seriously. He realizes the great value attached to having the professional an important part of an organization in which he can claim membership. He knows this association assures him fundamentally-correct information, on things pertaining to cinematography. He knows the source of his information is authoritative; that it comes from men who have made this art their life study and not merely a by-product of an industry which grew up around a hobby.

The average British amateur is very well versed in photography; with this new set-up much will come from the British cinematographer.

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I Remember Way Back When

Continued from page 170

We had but one grade of negative, Eastman orthachromatic, and thought ourselves lucky to get that. When afternoon brought a yellow light, we stopped shooting. This yellow light was a serious bugaboo. I recall, a bit later, the "Don't Shoot" flag at Universal. A flogpole was put up on a knoll where it could be seen from all sections of the lot. When a cloud shadowed the main office building or the light appeared yellow to the camera department head, up went the flag and all shooting ceased. That camera department head, by the way, quit shortly after to take up the more advanced profession of selling Fords.

We were not held in any particular regard by the native community nor by the outside professional world. I know that I looked with natural distaste upon the capers and crimes I was daily committing against the fair name of photography. No self-respecting photographer should be so demeaning himself, I very well realized, but the excitement held me fast.

One famous New York stage monogger—now one of our most successful character actors on the screen—was imported to lend his talents to Hollywood. He stood steadfast against such professional slumming. Finally he condescended to accept a fat salary with expenses just to visit us and see how movies were made. During the month of his sojourn every effort was expended to convince him of the respectability of our efforts. But he would have none of it. He rejected the proffered directing contract written in fabulous figures and haughtily returned to New York. The auto might be here to stay, he reckoned, but not the movies.

Progress came rapidly. Otis Turner, the "Deon of Directors," produced that great historic opus, "The Coming of Columbus," in Chicago. In one majestic reel he pictured the whole affair, winding up with Christopher and his crew landing on the lone front in full regalia. To capture the authentic and exotic tropical atmosphere, he stuck palm leaves—not palm trees, mind you, but just leaves—in the sand!

I went into big—colossal, I might even say—productions in 1912, these running into two full reels. "Early Days Out West" was the first of these gignotics. Wallace Reid was the star. His father wrote it and Wally did the cutting.

Soon after, William Bitzer, justly famous camera man for D. W. Griffith, startled our world by using close-ups. Loud were the repercussions of this unprecedented move. Screen characters were being mutilated by being ruthlessly cut off at the knees or even up to the

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waist. The audiences wailed and protested. They were paying their good money to see all of their favorite screen actors—not partians of them. Actors, of course, went far the new idea with great gusto.

A golden-haired girl had come to Hollywood. She was of the stage, an actress, a "star" no less, with name featured on the screen for personal identification. She was the "Biograph Girl" later, "America's Sweetheart." Her name was, and still is, Mary Pickford. One day Jesse Lasky called me in and awarded me what was considered the

chicest camera assignment of the day, the plum of photographing Miss Pickford. I photographed her in "How Could You, Jean?" in 1915 or 1916, and in every following picture she made for twelve years. It ran up to five reels in length. William D. Taylor, later murdered, was director.

I had a Pathe camera with the same single 50mm lens. I had Kleig lights, boards and spats, and reflectors. Motion picture camera work was graduating into realms of photography.

Those, my friends, were the halcyon days!

FILMING THE QUINTUPLETS

Continued from page 163

our crew to that number, with Dr. Dafee, of course, included: if for any emergency we needed an extra man, Dr. Dafee, abiding by his own rule, court-ously gave up his own place.

When the word came that the babies were ready, we would turn on the lights. Far if the lights were on when the babies were brought in, they would not notice them; if we turned them on while the quints were in the room, though, they would notice it at once. Once the babies entered, we simply started the camera and let them "direct" themselves. They did it all right! Our Hollywood actors—Jean Hershalt and Dorothy Petersen—were unusually capable players, but they found prepared routines and lines were of no avail with the quints. These young ladies simply took things into their own chubby hands, and instead of the grown-up players "leading" them to do what was wanted, the babies did as they pleased, leaving the grown-ups to follow gaspingly.

Same measure of "direction" we did manage to achieve, however. If for instance we wanted all five to do something—like tipping over a chair, for example—we would get one of them to do it. Then all the other four would follow suit! Taa, if we wanted them to look one way or the other, we could usually attract their attention by turning on a hitherto dark lamp on the side we wanted them to turn toward. I had to evaluate a most elaborate set of pantomimic signals to tell my electricians what I wanted done during a shot. We gestured not only because we were recording sound, and because voices might distract our little starlets, but because frequently I would set up some of the lamps outside, to throw their beams through a window, replacing the sun.

Since we couldn't predict what the babies were going to do, or when, most of our scenes consisted of the unbroken 1,000 feet of film in the camera's magazine. The cutter did the rest! We

made long-shots, with a wide-angle lens, medium-shots, and individual, big-head close-ups of the babies. In making the closer shots, we generally used normal focus lenses rather than lenses of longer focal length. An advantage in this, of course, was the fact that we had the camera in a soundproof "blimp," so its

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noise could not attract the attention of the quint being closeupped.

The lightings were kept very simple. In most of the shots, we used the same sort of a straightforward, balanced front-lighting that any home-movie maker would use. Frequently, as the weather was cloudy most of the time, we would set the two Photolites outside a window, and use the strongly directional beams from their polished mirrors to suggest sunlight along the inner walls. On sunny days, we actually drew the curtains, for the sunlight streaming through the windows would have been too much for our softer light to balance!

Every bit of this technique can be adapted to the requirements of cinefilming babies in 16mm—or 8mm, for that matter. Fast film and light-walled rooms will simplify your lighting (the Dionne's nursery had cream-colored walls). Your regular Photoflood lamps will do excellently; fit them with simple diffusers of the same translucent "day-light blue" gelatin we used, if you can get it, or with daylight blue tracing-cloth, otherwise. Keep your lighting simple—no backlighting or other tricks. Flood it pretty uniformly over the whole area you expect the baby to move about in; you can't tell where the youngster may choose to do his acting, you know.

Have everything set up and ready when the baby comes into the room; don't try to set up the camera and lights in front of the baby, for that will waste time, and make the baby so curious that you won't get good pictures. And do your filming during the baby's regular playtime, so that you'll get the child fresh and in a playful, natural mood. Don't for heaven's sake, drag him out of bed, or from his play, to be pictured; the only thing you'd get under such conditions would be a picture of a cross baby.

Have the lights on when the baby comes in, and start shooting right away. If you want to direct his attention, leave one light off, and switch it on when you want the baby to look that way. Avoid sudden noises and movements; with an ordinary camera, don't try to come so close that the baby will want to investigate its purr.

And let the youngster "direct" itself. Give it something interesting to do, and it will make an interesting picture without any help from you. You don't have to show a baby how to be cute!

Make your scenes the full length of a camera-winding. You can always cut out surplus footage—but you can't capture cute actions your camera has missed. You may use more film that way—but believe me, you'll also get real baby pictures.

In all of this don't forget another important psychological phase of child-photography: having someone the child knows and loves present, to put him at

ease. I learned this long ago in photographing my own children. Moreover, I found that I'd get the most characteristic pictures if I let somebody else handle the camera, while I stood by—either in or out of the picture, as the occasion might demand—to reassure the youngsters. If you do the camerawork yourself, nine times out of ten, your little subject will become so engrained in "pasing for Daddy" that the picture on the screen will look horribly stiff and unnatural. But if you can leave the camerawork to somebody else, you can easily get the youngster to doing something that interests it and is natural; your mind (and the child's) will be free from all thoughts of pictures—and then your accomplice at the camera can easily get really characteristic actions and expressions.

The same idea is equally valuable if you are picturing someone else's children. More so, perhaps, for the child will be more at ease with some loved one around. We found this true with the quints: they idolize Dr. Dafoe, and when he was in the room, they were like different children. In fact, not only his fine cooperation, but the absolutely marvelous way he is bringing these children up, should receive the lion's share of the credit for

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the pictures we got. No father could love his own children more deeply, or more intelligently, than Dr. Daffie loves his little charges, and he is such a fine man it is no wonder that the babies reciprocate his affection. And where such a band binds an adult and a child, it

will show on the screen, even if the grown-up is not in the picture, but merely smiling reassurance from beside the camera. So don't be one of those cynical camerists who considers the presence of a fond parent a hindrance in picturing the baby!

Explaining the Laws of "Symbolism"

Continued from page 165

law number 4 because the audience had to think several times before the meaning was understood because the "symbolism" was incomplete inasmuch as the electric bulb was still burning even though the wire was motionless. The motionless wire built up one idea which was torn down at the same time by the burning bulb. In other words: This "symbolism" was inconsistent as to its meaning and therefore defeated its very purpose. This "symbolism" was applied just for its effect (swinging light throwing shadows over watching man) with entire disregard as to its purpose of story-telling.

The correct "symbolism" in this particular scene would have been a shot of the battle of wine, upset during the fight, slowly pouring out its liquid on the floor, finally dripping until the battle is empty and the last drop had splashed on the floor in the pool of wine.

This "symbolism" is correct because it obeys all four fundamental laws and is consistent in its application: It is universally understood (law number 1); it is in the mood of the sequence inasmuch as the battle of wine (drink) is close to drinking man (law number 2); the object is part of the locale, very much so

because the stabbed man had handled the battle and poured drinks from it (law number 3); it is recognized at first glance: liquid dripping out of battle—spirit (life) leaving body of stabbed man (law number 4).

"Symbolism" must, in order to be successful, like everything else in picture-telling, be applied with consistency (according to its laws), and used with common sense, something which is often very much lacking in picture-makers.

The Simplest Filtering is Best

Continued from page 166

definite separation between the horizon and the sky. A mild correction will darken the sky several shades, until it begins to provide something of a background for the clouds; and it will begin to make the various greens of the foliage separate, and if there isn't much haze, will sharpen the horizon-line. An intermediate correction will darken the sky until it gives us a gray that is a close monochrome approximation of what our eyes see in the blue of the sky, and the clouds will stand out normally. At the same time, the other factors will improve similarly. An extreme over-correction, on the other hand, will over-darken the blue sky—sometimes turning it almost jet black—and the clouds will of course stand out exaggeratedly. At the same time, it will overdo the separation of the various green tones in vegetation, and it will cut through most haze like a cleaver.

Half the art of filtering lies in learning when to use which type of correction. It isn't so much that you can produce highly corrected effects—it is deciding if you should do it or not. Extreme corrections may make an individual scene very striking; but the relation of that shot to all the contiguous scenes should be weighed carefully beforehand.

And there's another matter that demands consideration when you are filtering: the effect of filters on people in the scene. All of these filters, in darkening the blue, tend to lighten the yellows and reds. In other words, suppose we begin a sequence showing a girl wearing a red dress: where no filter is used, that dress will photograph rather dark—just how dark depends, of course, on the type of film used. But as we start filtering, each step in filtration

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will progressively lighten up the dress, until with the more extreme degrees of over-correction, the dress which we first saw as a dark gray or black, has become a very, very light gray—almost white!

The same thing happens to the red (natural or otherwise) of the lips and cheeks, and to a certain extent to the normal flesh tones, as well. Meanwhile, our pretty girl has become vastly less pretty!

Of course, there are times when this effect may be all to the good. For instance, if you are traveling in the South Seas, in India, or in Mexico, where so many of the natives have dark complexions you will find that even on Superpan, unfiltered, their skins photograph abnormally dark. Putting on a fairly potent filter (on Panchromatic emulsions, a G is good), you can lighten these swarthy skins to a point where they will be much more pleasing. On the other hand when you film a florid-faced person like Irvin S. Cobb, avoid these filters as you would the plague!

I suppose that before we leave the subject of filters, some reference must be made to the matter of "filter-factors". Contrary to a very general misapprehension, these are not rigidly fixed quantities. Far from it—they vary according to the type and make of film used. If you will stop and remember that each different type of film "sees" colors differently, and that the various brands of film have minor differences in speed and color-balance, you will see that this must be so. Take the G filter, for example: on Ortho film its factor is 24; on Agfa Plenachrome, 8; on Eastman regular Pan, 5; on Eastman or Agfa Superpan, 3; and on DuPont Super Pan (negative), 2.9.

Lastly, there is always the question of deciding which filter to use. The simplest way, I think, is to judge visually. Get a good monotone viewing glass—and be sure to get the type intended for the film you use; an Ortho glass is no use if you are using Pan nor is a pan glass accurate with Supersensitive. Look at the scene through the glass: if it looks all right, don't bother about a filter; if it doesn't look the way you'd like it screened, hold your filter in front of the viewing-glass. When the scene looks the way you want it, as seen through viewing-glass and filter, you are looking through the filter that will give you the right effect on the screen.

Wheels of Industry

Continued from page 171

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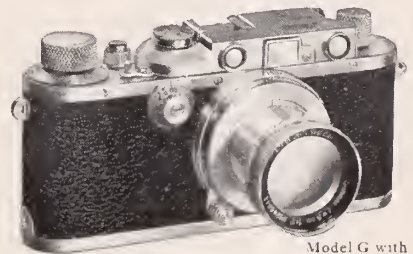
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New Films

● Four additional brand-new films by the well-known naturalist Arthur C. Pillsbury are announced for outright sale and rental by Bell & Howell Company. The films are:

Life in the South Seas (1 reel)—A trip to Hawaii and Samoa.

Life Under the South Seas (1 reel)—Shows chiefly underwater photography and how it is done.

Plants Without Soil (1 reel)—A presentation of a radically new scientific method of agriculture.

Reproduction of Plants and Lower Animals (1 reel)—A scientific biology film.

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Lens Hood

● A new lens hood and graduated filter are announced by Burleigh Brooks for use with the Rolleiflex and Rolleicord cameras. The hood, correctly shaped for the square format of those cameras, is fitted with a cam-actuated contracting

grip arrangement which practically locks it to the lens mount. Provision is also made for holding the new 33mm disc filters inside the hood.

New Leica Accessory

● A new rapid winder has been added to the Leica accessories according to an announcement from E. Leitz, Inc. This consists of a special baseplate which is interchanged with the regular baseplate of the Leica. A trigger is provided on the rapid winder, and by pulling it along a groove, the shutter is wound and the film transported. To make the exposure, it is therefore, only necessary to pull the trigger of the rapid winder and press the shutter release button. The rapidity with which exposures can be made is limited only by the speed with which the photographer can pull the trigger. It takes but 15 to 20 seconds to make 36 exposures.

We are informed by E. Leitz, Inc., that a slight adjustment will have to be made on older models of the Leica camera to enable them to accommodate this new accessory.

British Factory for M-R Lamps

British and Continental studios are soon to have British-built Mole-Richardson lamps. An English affiliated company is being formed to manufacture and service Solarspots, H-I-Arcs, and other M-R products abroad. Peter Mole, President of Mole-Richardson, is now in London completing final organization of the firm's British offshoot. With him is Robert Linderman, who recently resigned from the Hollywood staff of the General Electric Company to take the post of managing director of the new company.

Soft Focus Lens

● According to an announcement from Burleigh Brooks, he has placed on the market a Rolleiflex lens accessory known as the Duro Rolleiflex Soft-Focus Lens. From the description it appears that it is only necessary to place this over the regular lens, the same as a portrait lens is attached. It apparently does not take the place of the existing lens.

A Continuity for Easter

Continued from page 164

SCENE 44: CLOSE-UP of Junior stuffing a portion of egg into his mouth with most evident enjoyment.

SCENE 45: CLOSE-UP of Daughter, applying salt and pepper, disposing of the egg in approved fashion.

SCENE 46: CLOSE SHOT of Daughter placing rabbit on table between herself and Junior.

SCENE 47: CLOSE-UP of the chil-

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dren with their Easter rabbit. They are trying to share their eggs with the rabbit. It sniffs at the proffered tidbit,

wrinkles its nose, but declines. The children are laughing merrily. It has been a great Easter. FADE OUT.

A JUNIOR SOCIETY

For the Amateur

The American Society of Cinematographers has organized a junior branch of its association for the amateur to be known as the SOCIETY OF AMATEUR CINEMATOGRAPHERS.

For many years amateurs have been requesting the American Society of Cinematographers to form an organization for them that would be representative, authoritative and instructive.

While it would be easy to form such an organization in the spirit of enthusiasm that usually accompanies such pleas, but to insure the continuance of such an association it needs real ideals and a constructive policy.

The Society of Amateur Cinematographers is not just a society to give to the amateur letters to be used after his name and it does not throw its membership open to everyone who has the fee to join. The Society of Amateur Cinematographers is based on strict and sensible requirements.

First, the applicant must own a camera; second, he must have made motion pictures, and third, he must submit a picture to the reviewing board which is made up of members of the American Society of Cinematographers. This does not mean that the amateur is going to be judged by 100% professional standards as practically every member on the reviewing board operates either an 8mm or 16mm camera and is familiar with the shortcomings of the amateur's equipment.

When an amateur has been admitted to the SOCIETY OF AMATEUR CINEMATOGRAPHERS, it is

a sign of achievement; it is an indication that he is truly an amateur cinematographer, and he knows that his fellow members are active and accomplished amateurs. Also he is being guided by experts, by the acknowledged camera masters of the world, by Hollywood's greatest directors of photography.

Membership will include a subscription to the "American Cinematographer". It will also include the use of the outstanding films made by members of the Society of Amateur Cinematographers. As films are submitted, the best will be duplicated and an analysis prepared by a member of the American Society of Cinematographers. This analysis will go with the picture and the picture will be available to any member of the Society of Amateur Cinematographers.

For the most outstanding members and the most able amateur cinematographers, a fellowship will be created, giving that amateur the title of Fellow of the Society of Amateur Cinematographers. Requirements for Fellowship will be announced later.

Membership in the Society of Amateur Cinematographers gives each member access to the film library, privilege of asking questions, and advice on all branches of movie making.

As the Society grows, it is the plan to create branches in other centers to be made up of members living in those cities. In Hollywood a branch will be created and the programs originated here will go forward to other branches as units.

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The Motion Picture CAMERA Magazine

JUNE,
1936

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Conditions in London Studios
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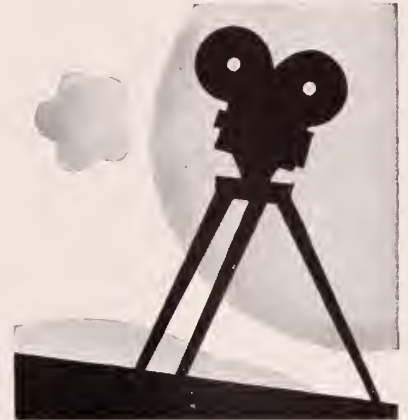
What to Read

THE PARAMOUNT Transporency Air-Turbine Developing Mochine By Wm. Stull, A.S.C.....	236
POWER FOR Locotion Lighting By Elmer C. Richardson.....	238
JOEPH AUGUST Sets His Own Precedents By Harry Burdick.....	239
WHEN CINEMATOGRAPHERS Were 24-Sheeted By Reginold Leslie.....	240
CINEMATOGRAPHIC Working Conditions In London Studios By Horry Zech, A.S.C.....	241
A. S. C. MEMBERS on Porode.....	242
MAIN ELEMENTS of o Successful Picture By Mox Liszt.....	244

Next Month

- Several stories on the technical side of motion picture moking will be written by out-standing members of the American Society of Cinemotogrophers.
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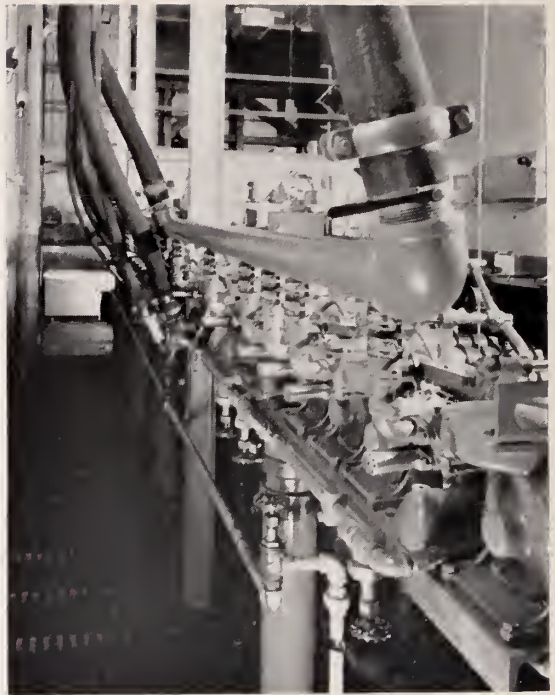
ONE OF THE most remarkable devices recognized in this year's Academy Awards for Scientific and Technical Achievement is the Paramount Transparency Department's Air Turbine developing machine which, according to the report of the Board of Judges, "—marks a notably progressive step in the processing of motion picture film. Its various features distinguishing it from the ordinary developing equipment, such as its air-turbine drive, simplicity and flexibility of speed control, automatic solution pep-up, filtering and non-oxidizing circulation system, close temperature control, pressure jet turbulence, etc., all combine to make the machine an important contribution to the technical excellence of the motion picture." An equally significant tribute to the machine's excellence is the fact that the Research Laboratory of the Eastman Kodak Company recently purchased a set of plans and specifications of the machine, and is constructing a duplicate at the Kodak Park research laboratory.

The Air Turbine Developing Machine was designed and built under the supervision of Farciot Edouart, head of the Paramount Transparency Department. Much of the construction was done in the studio's Precision Machine Shop, under the direction of William Rudolph, Paramount's Chief Mechanical Engineer. The machine has been in daily use for several years, and its construction, and the painstaking research connected with its designing, extended over a period of more than three years. Designed to meet the varying and exacting needs of developing process background plates, and constructed with the most meticulous attention to detail, it is doubtful if a developing machine of comparable precision exists anywhere in the world. Mr. Edouart's vision in creating such a machine and applying it to practical use in production is a most notable achievement.

The machine is a single-strand type with a capacity, according to the speed at which it is operated, of from one to 90 feet per minute. As it was designed to handle either color-separation or projection background plates, unusually ample tankage is supplied: the machine is capable of performing 17 separate operations. It may therefore be used for a wide variety of purposes. While designed primarily for precision development of positive film, it may be used for developing negatives, or for such other tasks as the processing of subtractive color-prints, reversal-processing, tinting or toning, and the like. No sprockets are used in the film-moving drive, and the rollers used are of such design that film of any width from 35mm to 70mm ("Grandeur") can be processed. The rollers are sectional; by adding or removing the center-section units, the dimensions of the roller can be adapted to any film-standard. Bakelite is the material used in the construction of the rollers, and as they are mounted on ball bearings, the film can be moved easily, and under an absolute minimum of tension.

Each section of the machine is driven by an individual turbine, powered by compressed air. This provides the smoothest drive known, and also permits independent control of the operating speed and timing of each operation. This has been made possible by providing wash-tanks of more than ample capacity between each of the chemical stages of the machine, with an automatic adjustment through which the amount of film in these wash-tanks is governed by the operating speed of the adjacent stages. It is thus possible at any time to increase or decrease the developing-time (or the speed of any other operation) without in the least affecting the speed and timing of any other stage of the processing.

The jet turbulence system used in this machine was an integral part of the original design, and as such represents one of the first practical applications of this principle to the elimination of the so-called "directional effect" and Eber-



Detail showing individual driving turbines

The Paramount

hardt or Mackay lines in machine-developed film. The solution-circulating systems, instead of merely discharging into the tanks, terminate in horizontal tubes which are placed close to the surface of the film-loops in the tank; a series of these tubes are placed on each side of the film-loop, at different depths within the tank. Slits in the tubes eject the solution in a continuous spray, directed against the face of the film, and at an angle against the motion of that part of the loop; where the film moves downward, the sprays are directed upward, and vice-versa. This spraying action assures that the surface of the film is always bathed with fresh solution, and the force of the jet is sufficient to clean away the residue from the chemical reaction, which would otherwise cling to the surface of the film, retarding the chemical action and causing directional streaks.

This jet turbulence is used, not only in the essentially chemical operations (developing, short-stop, fixing, hardening, etc.), but in the various washes, as well. In these latter operations, the water-jets give the film a gentle, yet thorough scrubbing, effectively removing any trace of the chemicals being washed out, and the by-products of the chemical reactions.

In practice, this system of turbulence has been found not only to eliminate directional effects, but to give a much more thorough development. The chemicals have been found to penetrate the emulsion deeper, and to give more clear-cut, finer grained images.

The solutions are automatically filtered, "pepped up" and temperature-controlled as they circulate. Each time they pass through the circulating system, they are filtered, and receive an accurately metered amount of fresh solution which offsets the strength lost in the developing,

fixing, or other action. So accurate is this rejuvenation that, measured by the standards obtaining in conventional machines, the life of solutions is abnormally long. The active life of developer, for instance, is measured not in days or weeks, but in months.

Each solution is maintained at its most effective temperature by an automatic temperature-control which works to a tolerance of plus-or-minus $\frac{1}{4}$ of one degree. It has been found that each solution has its individual optimum working temperature, and that the best policy is to adhere closely to these temperatures, rather than to maintain a standard, uniform temperature for all solutions. Automatic recording thermometers record the temperature of each solution, and the records are carefully filed for reference. The drying-box is supplied with carefully filtered air of the correct temperature and humidity from a special air-conditioning machine. The developing-machine room is likewise air-conditioned.

The chemical mixing-rooms are entirely separate from the machine and its replenishment-tanks, being located in a separate section of the laboratory, on an upper floor. Rooms for mixing the various solutions are separate, and great pains are taken to avoid any chemical dust in the air. All chemicals are, of course, tested for purity and consistency.

The water and power supplies for such a machine are of the greatest importance. In addition to a very generous use of distilled water, all water taken from the city mains is quadruply filtered before use. This is true even of the water used in the washing and soaking operations. The

would not have any deleterious effect upon the chemicals, or upon other parts of the machine with which they might be in contact. The tanks themselves are made of wood, impregnated under high pressure with a special bitumastic compound which is impervious to photo-chemical solutions. All of the metal parts, including elevators, pumps, valves, etc., are of Resistal alloy.

This metal was chosen only after tests which extended over a period of several years. After discussing the matter with the heads of the industry's outstanding laboratories, Edouart conducted preliminary tests of the various metals they recommended, ultimately narrowing down the possible choices to two. Samples of these two metals, in several sizes and worked under varying conditions, were immersed in samples of his plant's standard solutions for periods from six months to one and one-half years. In several instances, the tests were duplicated and averaged, in order to eliminate any possibility of error. Ultimately, Resistal No. 4-B was chosen, as none of the tests showed it to have any effect upon any of the solutions. Even such commonplace parts as nuts, bolts, screws and washers were specially made of this alloy, and rigid specifications as to their manufacture set up, so that no unforeseen condition in the manufacturing process might alter the metal's characteristics.

It was obviously impractical to make the tremendous amount of tubing used in circulating the solutions of this expensive alloy, however. Therefore a special, hard-rubber tubing was used. In the production of this tubing, the sulphur used in the vulcanizing process was reduced to a point where it could not endanger the purity of the solutions passing through the tubes. The special composition used is not affected by the warm water (125° F.) used in cleaning the circulating system. Similar precautions were taken with the rubber hose used in the many flexible connections in the circulating system, especially to insure that no shreds of fabric could become detached and get into the circulating system.

Such a machine as this could hardly develop its maximum value, however, if the routine of the laboratory of which it is a part does not attain equal precision. Such precision is attained in this laboratory. As the prints are chiefly used for projection-background process work, it is necessary that the steadiness of the printer used be at least equal to the accuracy of the film-perforations. Using the standard Bell & Howell perforation, it was found that this considerably eclipsed the accuracy of existing contact-printers. Therefore a unique optical printer was developed, made and oper-

Continued on page 246

Transparency Air-Turbine Developing Machine

by

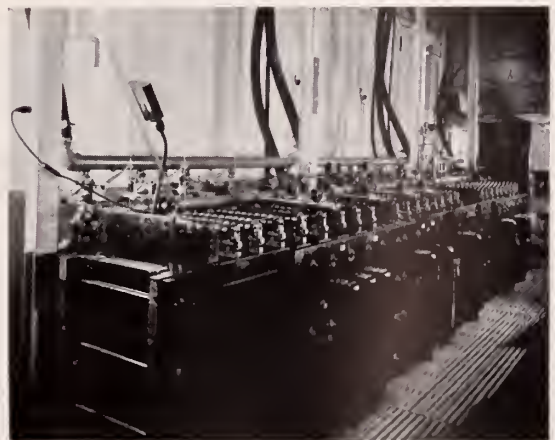
William Stull, A.S.C.

water passes first through two large sand-and-charcoal filters; next, through a high-pressure stone filter; and lastly through a filter of specially purified, long-staple cotton.

As the film is driven through the machine by air-turbines, the maintenance of an adequate supply of compressed air to drive the turbines is vital. This is somewhat simplified by the fact that the turbines used operate at a relatively low air-pressure. Two independent, electrically-driven compressors supply the air; in the event of failure on the part of one of these, the other can immediately be brought into action. As this machine is used principally for the development of positive film, it has not been considered necessary to provide a secondary source of electrical power to drive the compressors in case of a failure of the electrical power-lines. This could easily be done, however; at Mr. Edouart's suggestion, the negative-developing machines of the studio's laboratory have been fitted with an automatic hydro-turbine device which, when the outside power-supply fails, automatically connects the water-driven motors to a battery of accumulators.

In the construction of this developing machine, unusual precautions were taken to select materials which would not only perform their functions enduringly, but which

General view of the air-turbine developing machine





Supplying Power for Location Lighting

by
Elmer C. Richardson
Mole-Richardson, Inc.

IN ORDER to maintain in scenes photographed away from the studio the same photographic quality that characterizes studio-made shots, it is necessary for both day and night work on location to utilize the advantages of lighting by artificial means. This adds to the normal location-equipment considerations the problem of providing a source of electrical power which is portable, silent, and adequate to the electrical needs of the scene. In some instances, this problem can be solved by the simple expedient of tapping nearby electric power lines and connecting portable electric motor-generator sets which will produce the necessary 115-Volt Direct Current for lighting. In many more instances, such power lines are not conveniently available, and portable generators driven by some such prime movers as gasoline engines must be used.

For this purpose, two types of portable gas-electric generating plants have been developed, each designed for a specific class of service. Where daylight is to be supplemented by artificial "booster" lights, the electrical load is not great, and small units with a capacity of from 40 to 60 kilowatts suffice. Where night exteriors are being made, on the other hand, the lighting problem to a great extent parallels that of lighting a large stage, and larger quantities of electricity are called for, necessitating larger and more powerful generating units.

In the past, many of these gas-electric generator units have been built up around war-surplus airplane engines, which could at one time be obtained very cheaply in units of 90, 150, 220 or 440 horsepower. Aside from the fact that these engines are not so readily available today, they must be regarded as unsuitable for modern use as they are noisy, and lack the reliability of modern power-plants. Today's practice is to design a portable gasoline-electric generator unit around a thoroughly modern gasoline engine.

For the small "booster" plants, several of the better types of automobile motors have been used with success, as their power corresponds with that required in this service.

Developing the larger, high-power equipment for large night locations, etc., presents a more difficult problem, as larger amounts of current are required, and larger and heavier generators must be used, driven by heavier and more powerful engines.

The latest development in these large gas-electric generators—an equipment put in service within the last month

—is capable of delivering a current of 1200 Amperes at 125 Volts intermittently, or a continuous flow of 1000 Amperes. Powered by a 275 hp. heavy-duty gasoline engine and semi-permanently mounted on a streamlined truck, the unit is highly mobile, and may be operated in the open, under heavy load, reasonably close to the microphone.

The engine in this generating plant is a six-cylinder Hall-Scott "Invader" marine motor, developing 275 hp. at 2100 rpm., and 248 hp. at 1800 rpm. A marine motor was chosen in preference to other available heavy-duty types because such motors are generally designed for relatively long periods of constant-speed operation under heavy load. The motor needed only minor modifications for this use; chief among them being the removal of the standard marine reverse-gear and some re-designing of the crank-case, which were done by the Hall-Scott engineers, and the addition of a centrifugal pump to circulate the water for cooling.

The generator was specially designed by the General Electric Company to match the engine's power-curve. It attains its rated voltage at 1200 rpm., and delivers 1000 Amperes continuously at 1600 rpm. Loads of as high as 1800 Amperes may be carried under the conditions of intermittent load usually encountered in motion picture production. This generator is unusually compact, and weighs only 2100 lbs.

In a plant such as this, the cooling of the motor and generator is obviously of vital importance. The latter is self force-ventilated, and is mounted at the air-intake end of the unit. In front of it is mounted the radiator for cooling the engine's water. This is of the sectional type, composed

Continued on page 249

Joseph August Sets His Own Precedents

by
Harry Burdick



Joseph August, A.S.C., discussing script with Katharine Hepburn. August is directing the photography in Miss Hepburn's latest picture.

NO ENCYCLOPEDIA of Hollywood's cinematographic history, past or present, can be complete without comprehensive itemization of the deeds performed by Joseph August on and with ribbons of sensitized celluloid. For he is one of that small but accomplished group which practically founded the art and piloted the photographic parade to its imposing record of noteworthy achievements.

During the year 1912, August descended upon the area of real estate termed Hollywood and lensed the highly-dramatic offering, "The Lure of the Violin," a "super two-reel feature" of extraordinary box office lure produced by Thomas Ince.

From that time forward and including the historic theme, "Mary of Scotland," currently taking form before his camera, he has contributed importantly to the sum total of cinematographic progress. Possibly the most widely acclaimed contribution of the prevailing period is his "The Informer," which was nominated with scarcely a dissenting opinion by critics of the press here and abroad as the outstanding picture of the year just passed.

"The Informer" is a fair example of the artistic courage and deep-seated technical strength that marks his film creations. No meek and acquiescent follower of well-beaten paths in this Joseph August! To the contrary, his is a bold, brave and rugged career of adventure into uncharted cinematographic courses. Study of "The Informer" bears out this strength of artistic character. "Mary of Scotland," when unfurled, will present still further evidence of this untrammelled force.

August holds to the premise that he is concerned with the making of motion pictures; motion, not talking, pictures. In spite of the introduction of sound in dialogue and sustaining orchestrations, and other such alluring elements, he never loses sight of the fact that the projected entertainment is primarily a picture. As the result, he strives so to photograph a production that it will of itself pictorially narrate the drama involved. He spurns the sound track as a crutch for insufficient pictorial values. His lensed works when screened alone and minus the sound, relate a story in surprisingly complete degree.

Given so adequate a pictorial foundation it is readily to be realized that with the addition of a superstructure of dialogue and music, the ensemble provides audience appeal in degree far beyond the ordinary.

For one who is ever searching out new photographic trails, he has sound respect for the methods tried and proven through his years of shooting silent pictures. Human nature varies little year to year. Audiences still respond to

the same pictorial dramatics. So August shamelessly uses them. That is, he digs down in his bag of experiences and comes up with a tested photographic expedient. Then he develops that expedient to a reasonable extreme, in line with increasing discrimination of present audiences. These modernized versions of enduring methods he utilizes with telling effect, even though they fly in the very face of prevailing styles.

He still has good reason to adhere to the principle that a player's eyes are the most expressive mirrors of emotion. Whatever the nature of the film fashioning at hand, the eyes of his characters without exception are so composed as to hold the audience's concentrated interest. This applies even though other factors usually held in high esteem must be sacrificed photographically.

He dares to be natural and real and life-like with his imaged characters. Yet he relishes opportunity to go to extremes.

Excerpts from his "The Informer" are illustrative. The opus is of course a weird characterization of a man. The mood is similarly weird. The entire work is an example of effect lighting. He has a foggy street at night. With but three light units he illumined the fog and left it to such light as was reflected by the particles of moisture in the misty atmosphere to make his characters visible.

He plays a love scene in silhouette—with no light whatsoever on the players other than a thin streak across the star's eyes. This in open defiance to the generally followed belief that such scenes must always reveal the star in undiluted detail.

His effects are daring—but so human and wholesome and natural they are not instantly labeled as effects by onlookers. He uses few light units, a handful is ample. He lights salient items and leaves it to shadows to do the rest. Hence, his scenes whether extensive or limited, possess a winning simplicity—the studied simplicity that only genius can maneuver.

He takes artistic liberties galore. He cares little for an arbitrary source of light. Deliberately he goes about giving audiences the qualities his long experience has taught him that they want to see. He will toss precedent and hallowed traditions aside unhesitatingly to please his ultimate critic, his spectators.

He never plans scenes in advance. To do so, with August, is fatal to the spontaneity and fluidity he insists on capturing. Scenes so planned, he finds, have trend to be too per-

Continued on page 245

When Cinematographers Were 24-Sheeted

by
Reginald Leslie

ON THE VERY COMFORTABLE veranda overlooking his well-kept gardens, I was talking with Charles Rosher. In fact, we were reminiscing. We were reconstructing verbally the days of 1921 when British International Pictures were making valiant bid for place in the cinema sun.

The film was "Atlantic," from a successful play, "Berg," presumably based upon the Titanic disaster. It was the first all-dialogue talking picture to be made on British soil; and the first multi-lingual, with versions in English, French and German. No expense or effort was spared to make of it an outstanding contribution to the world's screen library. It was to be a demonstration that England was capable of making films comparable to those issued by other countries.

From Germany was imported the famous UFA director, E. A. Dupont. And from Hollywood was secured the man considered by English experts as the leading motion picture photographer of the day, Charles Rosher. The fact that he had been born in London and had been a Bond Street photographer before the movies drafted him and launched him on his series of cinematographic triumphs, caused the London press to twist the lion's tail in most enthusiastic home-town-boy-makes-good fashion. That he was to "turn" for the picture was acclaimed reason enough for its success.

Indeed, the press scarcely made a mention of the cast. It was all Dupont and Rosher. Probably no cinematographer before or since has received the journalistic notice that was awarded Rosher. I recall vividly that I subscribed to this prevailing estimate of the photographer's relative importance in picture production. It was generally regarded—and soundly, I still maintain—that as photography was the medium of expression, the photographer was the all-important artist. In other words, the picture-taker was the picture maker.

"Atlantic" was a considerable success. It was viewed in this country and given very favoring notices. Rosher stayed on to make more pictures on his native heath, including Elinor Glyn's initial directorial effort, "Knowing Men."

So much for our reminiscing. There was a bit of early Spring housecleaning going on in the Rosher home. You know what that means. It accounts for us being sequestered on the veranda. It accounts also for the unearthing of a dust-laden packet that had been reposing peacefully in some out-of-the-way nook for many years. Charles unloosed the packet. It contained clippings from old film journals. In light of present-day customs they are vastly pertinent in ways more than one.

Consider, if you will, this tabloid film review of nearly twenty years back. It is from *Wid's Daily*, December 17, 1918:

Wallace Reid in
TOO MANY MILLIONS
Paramount

Director James Cruze
Author Porter Emerson Brown
Cameraman Charles Rosher
As a Whale High Class Production
Story Well suited for fun-making
Direction Brought out small points closely
Photography Excellent
Lightings Gaod on players' faces and made
interiors look natural

Camera Work Same ingenious bits
Star Scores well as likeable comedian
Support Well balanced throughout
Exteriors In atmosphere of story
Interiors Always in good taste
Character of Story Harmless
Length 4,517 feet

To a follower of current press reviews replete with their professional and sympathetic understanding, this summary is amusing. The reassuring item that the story is "harmless" is particularly priceless. But there is basis for serious reflection in this old review. Notice if you will, that comments covering Photography, Lightings and Camera Work are given precedence over critical mention of the star and his anonymous, though balanced, support. This evidences the comparative importance, typical of the period, attached to photography. The industry had not yet lost sight of the prime fact that it deals with photographed pictures. In fine, pictures were—pictures. And photographic talent was correspondingly recognized.

This esteem of cinematographic arts was not restricted to commentators of the press. Studios and releasing offices felt it, too. Box office value of notable photography was generally accepted and emphasized to the film-eyeballing public.

As recent as 1924, billboards blazoning attractions of a picture listed the cinematographer's name boldly as guarantee of perfect pictorial entertainment. Even the colorful 24-sheets rendered this public recognition of professional prowess. In a press-book, I find a reproduction of this poster. It delivers a huge portrait of the star, and these words:

Mary Pickford
in

Dorothy Vernon of Haddon Hall
from the famous book by Charles Major
A Marshall Neilan production
Photography by Charles Rosher

And why not? It is pictorial amusement proffered. Surely, assurance that pictorial qualities are ably presented by a leading artist is argument for the public to attend.

If memory serves correctly, Mary Pickford was the first of our great stars to recognize and appreciate the full value of photography as a contributing factor to her continued screen success. She retained Rosher's services for all the twelve years that elevated her to fortune and renown.

Even today I hear of many of our leading stars refusing to entrust their visual charms to anyone other than a cinematographer of their choice. They know full well the need for being pictured properly into popularity.

Continued on page 250



Harry Zech
A.S.C.

or three independent laboratories in London. You can get good development from these sources if you explain in detail just what you want, and more or less sit on top of the job to see that you get it. There is the constant query, "Why do you want it that way?"

Rushes come through about two or three o'clock the next day and are viewed following dinner. Light tests come with the dailies. Naturally, this means money when sets are being held and doesn't speed production any.

Production as a whole is slow. It takes at least six weeks to turn out the average feature. "Things To Come," currently visible here, took a year to finish.

British temperament enters into this. Everything is done in due course, and without undue haste. A needed prop may arrive today or possibly tomorrow. There is none of our split-second speed so typically American.

And there's tea. At eleven in the morning and four in the afternoon, the staff quit for tea. You can be intensely engrossed lining up a difficult shot and all of a sudden realize that you are alone on the stage. All hands have silently stalen away. Your Yankee soul resents the interruption—but tea is tea!

Cinematographic Working Conditions In London Studios

ENGLAND is making remarkable progress in this business of motion picture production. The boom is on. Millions of pounds sterling are being poured into the industry. More millions are waiting impatiently. When I left London a few weeks ago, twenty-two new stages were under construction and still more were on drafting-room tables. There is no question but what Britain is determined to have its place in the cinema sun.

London, of course, is not another Hollywood. The largest city of the world was doing business long before films were thought of. Picture production is just another leaf sprouting on the immense industrial structure of the great metropolis. There is no closely-knit, central grouping of studios and studio workers to dominate life of a community, as is the case in Hollywood.

Studios and outside contractors are scattered over a wide area. From the British & Dominion studios at Elstree it is some eighteen miles to the plant of London Film Productions at Denham where Korda is now working, and about thirty-five miles to Ivor where the new British National studios are being erected. Transportation to and from these suburban points is somewhat of a problem, particularly during late hours.

To a cinematographer who has grown up with the industry and who takes as standard the high-pressure efficiency of Hollywood studios, English mechanical and technical equipment, and general studio procedure, seem sadly inadequate. However, in the past six months importation of proved Hollywood equipment and talent has bettered conditions considerably and will doubtless continue to do so.

Lights, as an instance, are not what we are accustomed to using. Mainly, they have locally-made copies of American units which are none too efficient. Open arcs are in abundance. But the modern units which have been evolved out of our long experience are more rapidly coming into use as our manufacturers open London factories.

Laboratory work is nothing to boast of, from our standards. B.I.P. has its own laboratory with none too modern equipment. Other studios send out their work to the two

by
Harry Zech, A.S.C.

The British cinematographer is his own operator. He sets his lights and then operates his camera. Very few are on contract. Most of them work by the picture. Their salaries are around twenty pounds—one hundred dollars—weekly.

For the Hollywood director of photography, an operative cinematographer is allowed. Quickly seeing the merit of this practice, the British boys are now demanding a full crew of aides. The operative cinematographer is not too well paid, getting some six to eight pounds the week. An assistant rates three to four pounds weekly. Regardless of hours put in, there is no overtime pay allowance for anyone. Actors are paid somewhere near one-third of prevailing Hollywood rates.

Living conditions are about a third more costly than at home. Gasoline, as one item, retails at thirty-five cents a gallon. I bought a car and paid out two hundred and fifty-two dollars for insurance, license and taxes before ever getting it.

Income tax will run at least twenty-five percent of salary. When you return there are still Federal and State in-

Continued on page 247



A.S.C. MEMBERS

ON PARADE

● **Allen Q. Thompson, A.S.C.**, director of cinematography for Buck Jones, is seemingly turning seaman. Jones is entering his seagoing vehicle in same regatta, race or competition of some kind. Thompson is a good showman and is doubling in brass—when not setting rifles and broads he will be a part of Jones's crew . . . such is the life of a cinematographer.

● **Charles Herbert, A.S.C.**, sometimes better known as "March of Time" Herbert, sailed on the good ship President Garfield on May the 8th, for the Orient to secure backgrounds and key scenes for the March of Time library . . . that is his original mission, but we'll bet our old box brownie that Charlie shoots a couple of news events before he returns. Herbert formerly was the cinematographer who shot so many of those beautifully photographed "Magic Carpets."

This sort of a job makes a fellow like Herbert, a producer, director, scenario writer and a news hound, as well as a cameraman. One of those connections where there isn't a dull moment.

● **Harold Marzorati, A.S.C.**: Dear Harold: We hear you are arriving at the studio an hour earlier every morning than any other director of photography. We have it on authority—whether good or bad, we say not—that you immediately hie yourself to a large and commodious room that houses the new velocitator. Of course, Harold, we do not suppose for one moment you want to use it, but we hear you wouldn't have any objections to seeing your initials on it for the next productions. Come on, Johnny Arnold, give Harold a break, you're breaking his heart.

● **Farciot Edouart, A.S.C.**, and **Dewey Wrigley, A.S.C.**, while shooting on "Chinese Gold" at Paramount wrote several verses to a song which might be entitled, "Whistling in the Rain." The particular shot called for rain, which was furnished in the usual overhead pipe-line fashion, but when the rain started raining the rain would also whistle. As we go to press it is reported new verses are being added, none of which are printable.

● **Tony Gaudio, A.S.C.**, according to Eddie Blackburn, was so ashamed of his golf game that he refused to spend his vacation as usual on the links, but this year hied himself to his father's cotton plantation in Texas to gather in what the boll weevil had left of the crop . . . or was it to get a bit of cotton for his ears so as not to listen to Eddie's stories of his "unusual" law scores.

● **Gordon Pollock, A.S.C.**, has evolved a double jigger. This is not the type of "jigger" used for Manhattans, or Horse's Necks . . . it's an adjunct to the Weston Exposure meter and with a twirl of a disc gives you a lot of vital information about shutter speed, lens speed and film speed or the articular light.

● **Wm. O'Connell, A.S.C.**, went on a "Mail Carrier's Holi-

day." He motored up to Yosemite on his vacation to do a bit of bi-pack color photography with his Leica. Just to keep himself in practice most likely, as Bill is one of the busiest Directors of Photography on the 20th Century-Fox lot.

● **Joseph Walker, A.S.C.**, has a yen to know what the other half of the world is doing so joined the ranks of Scott Radio owners . . . to jiggle around in these short waves . . . He heard some strange sounds the other evening and didn't know whether it was a bum sound track or whether he had Addis Ababa.

● **King Charney** of the Agfa Charneys, swears he would never listen to a radio. You know he bought it for the wifey and kiddies . . . like the electric trains dad buys for son. Well, King is getting thinner and thinner. He rushes home ostensibly to his meals, but obviously to his radio to see what new station he can get on the other side of the world. Or is he tuning in an Binghamton?

● **Ray June, A.S.C.**, is worrying . . . or is it his tonsils that are worrying? In any event Ray has a date with the doctor's knife in two weeks. He has his favorite operating room picked out . . . his favorite nurse and his favorite room with a southern exposure. Now he is wondering whether he will finish the picture on time to keep his many dates.

● **George Folsey, A.S.C.**, vs. **John Arnold, A.S.C.**, that's the way the golf score cards have been reading for several years. These two have been belittling each other's golf for so long that they both believe they are good, but Arnold claims George will not bet on his game any more, and George says you can't beat your boss. . . . And so the argument rages.

● **Wm. Daniels, A.S.C.**, is vacationing in the East. He will take in the races at Indianapolis on Decoration Day.

● **Chas. Lang, A.S.C.**, also is vacationing in the East. Will return via Canada and his auto.

● **Vic Milner, A.S.C.**, is rushing his present picture to completion at Paramount to find out if his boat has sprung any new leaks.

● **Fred Jackman, A.S.C.**, is trying to figure out how membership committees get new members. The Lakeside Golf Club has put him on the membership committee.

● **John Seitz, A.S.C.**, has acquired a permanent assistant cameraman. Son born to Mrs. Seitz recently.

● **Earnie Palmer, A.S.C.**, on his days off roams around the other studios . . . visits the boys . . . and invites them to come over to the 20th Century lot when they aren't busy.

● **Norbert Brodine, A.S.C.**, is figuring out new combinations of that game, "handies."

● **Chas Rosher, A.S.C.**, may renew old acquaintances back in his merry London. They are asking for him over there to shoot a super special. Rosher was photographer to royalty in England before he came to these here states to become a cinematographer.

W I N N E R

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EASTMAN *SUPER X*
PANCHROMATIC NEGATIVE

Main Elements of a Successful Picture

FIVE YEARS AGO Chaplin's film, "City Lights," was released to an eager public that received the film enthusiastically and made it a great box office success.

Today Chaplin's film, "Modern Times," is released to an eager public that received the film mildly and made the box office stay below expectations.

What has happened? Why the rather cool reception of "Modern Times" as compared to "City Lights"? Both pictures are the work of the same man, then why the great difference in reception? All these questions and many more have been asked, and no answer has been given that got at the root of things. No one answer is able to do this. An analysis only is able to satisfactorily define the reasons, and analyzing is something that the public is not able to do inasmuch as they do not care to find out the whys of a picture's success or failure as they only come to be entertained and, failing to be this, the verdict is adverse.

The public was definitely not being entertained for the greater part of "Modern Times" and the reason for this is definitely to be found in the picture itself.

Starting the analysis of "Modern Times," the very first question that comes up in our mind is: Did Chaplin lose his grip on the audience? And judging from "Modern Times" the answer is:

As an actor—NO!

As a director—YES!

The "actor" Chaplin is as funny and as pathetic as he always was. The audiences all over the world appreciate the "actor" Chaplin, but the way "actor Chaplin" was presented by "director Chaplin" was far from appreciated by the audiences who were to a great extent frankly bored by the material's presentation. No actor can rise above the "ways of presentation" of his material (the film) and if this method of presentation is ill-chosen and faulty any actor will suffer and no actor can correct it. And "director Chaplin" presented "actor Chaplin" in a faulty way.

The very first mistake committed by "director Chaplin" all through the picture was his disregard of the mental make-up of his present-day public. Today's audiences have been poisoned by the talking screen to such a great extent that any time a character opens his mouth on the screen the audience's mind demands to hear something coming out of it, be it sound or dialogue. Mouths were opened and closed and nothing was heard in "Modern Times," except once, the scene where "actor Chaplin" presents his act in the cafe, and this was only a fraction of the total time of the picture's enfoldment. The audience was irritated and shocked on seeing mouths open and hearing nothing.

Dialogue has nothing to give to the screen and always must be kept in a secondary place in relation to the visual action. This "director Chaplin" knows, and he also knows that the perfect picture is a silent one with accompanying music and sound effects to underline and add to the mood of the visual image on the screen. But he does not know how to present this vital knowledge to the audience, for if he had he would have done so in "Modern Times."

The secret of this presentation is: Never allow the actors to open their mouths, but make them express with their face, eyes, hands, body, etc., but never with the mouth because the moment the mouth is opened the audience's mind is ready (and demands) to hear something, and failing to do this the present-day public feels irritated and cheated and renders an adverse verdict on the entertainment value of the

picture. To be able to present a picture in this way a script has to be written with this idea in mind, of course.

Fault number two committed by "director Chaplin" in "Modern Times" was his effort in trying to make every character act along "actor Chaplin's" brand of acting. This was particularly irritating and noticeable in the introduction sequence of presentation of the "street-gamin" Paulette Goddard. Her erratic and speed-up jerky movements were a poor imitation of "Chaplin acting" and unconsciously called forth comparisons in the audience's mind who very much resented it inasmuch as this particular style of acting is so very much Chaplin's that no mind in the world accepts willingly another character with the same "brand" of acting.

To correct this mistake "director Chaplin" should have allowed only "actor Chaplin" to use this type of acting; and all other characters should have been brought up to today's standard of modern acting. In this way "actor Chaplin" would have stood out in successful comparison and brought home to the audience more forcefully his role of the misunderstood underdog, so pathetically funny in his always trying to do good and hoping for something better.

The third fault committed was the construction-presentation of the story-material. Chaplin's story-material was of vital interest to the audience; was practically a "j'accuse" of present day conditions of unemployment, etc., and was thoroughly familiar to the audience by their close connection with it in every day life.

This familiarity by the audience with the story-material would have been a great boost for the picture if "director Chaplin" had presented it in a well-knitted construction. As the story stands now it wanders and drags many loose ends with it, promising many things and redeeming hardly any.

One of the most annoying was the scene where the minister and his wife visited the jail. The minister and the warden enter the jail proper, while "actor Chaplin" and the minister's wife engage in a meaningless "stomach-rumbling" contest. This scene was definitely a "loose end" and dragged in by the heels. It did not fulfill its promise for something bigger as it made the audience believe it to be merely the foundation upon which a complete and meaningful sequence was to be constructed. The effect that this scene-without-reason had on the audience was the same one would create in a child by allowing it to get a taste of an all-day sucker, and then deny it the sucker. The final result in both cases, of course, is a tremendous protest. This scene had no business being in the picture and should have been omitted in entirety.

The story as it stood in the picture wandered badly and well because the story-construction demanded an abrupt change in viewpoint from Chaplin to the "gamin," and later on back again to Chaplin.

by

Max Liszt

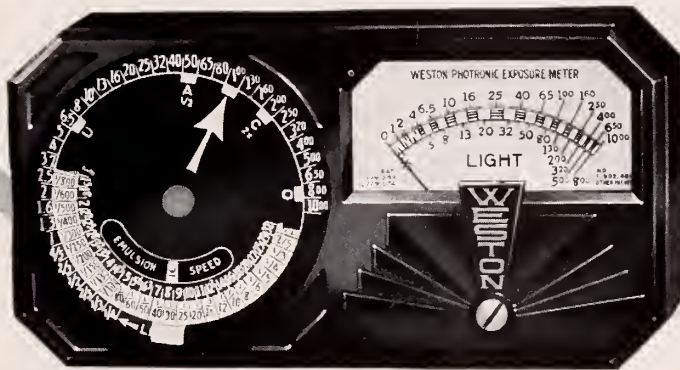
Director of "Lives Wasted"
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AMERICAN CINEMATOGRAPHER

6331 Hollywood Blvd.
Hollywood, Calif.

Paramount Transparency Air-Turbine Developing Machine

Continued from page 237

ated to tolerances impossible in contact printing. It is hoped that this printer may be more fully described in a later article.

Prints for the projection-transparency process must be made in an unusually wide range of densities and degrees of contrast; frequently, a background from the department's film-library, though a normal day shot, must be printed to give a night-effect, or vice-versa. In addition, the lighting requirements of two scenes, made with the same background-plate but with different foregrounds and action, will require background-prints of entirely different characteristics. Therefore, in addition to the most precise densitometric tests, print-timing and development are gauged personally by Mr. Edouart, backed by many years' experience in process cinematography.

Normal prints intended for transparency background plates are as a rule made to a rather higher Gamma than prints for ordinary use, but for some special purposes, an abnormally low Gamma is sometimes required, as well. The Gammas obtainable in most normal production laboratories rarely exceed a range of from about 1.90 to 2.10. Between the control obtainable in the printing operation on the special optical printer, and the precise control obtained with the air turbine developing machine, this plant allows a range in Gamma from .50 to 2.70.

The plant's operations are carried on as scientifically as though it were a research laboratory, rather than a plant handling the work of a busy studio department. Every detail of each operation is carefully recorded, and the records filed for future reference. Thus if at any time any particular shot is to be duplicated, every factor can be reproduced: individual emulsion characteristics, printing operations, development-time, temperature, and solution-strength, guaranteeing scientifically identical results regardless of the interval elapsed.

Joseph August Sets His Own Precedents

Continued from page 239

fect, too mechanically precise, in degree not encountered in normal existence. Like other great artists, he is blessed with restraint. He knows when to stop.

Too many a canvas has been over-painted; too many an otherwise imposing structure burdened by superfluous ornamentation.

As this goes to press, studio officials are mysteriously secretive as to "Mary of Scotland." But I hazard the prediction its screening will unloose extensive professional photographic acclaim. It

Back Issues of American Cinematographer on hand

1936—None.

1935—None.

1934—January, March, April,
July, August, September.

1933—March, June, October,
November, December.

1932—All months except
October.

1931—All months.

1930—All months.

1929—All months.

1928—April, May, June, July,
August, November, December.

1927—All months except October
and November.

1926—All months.

1925—All months except February,
August, November.

1924—All months.

1923—March, April, May, July,
August, September, October,
December.

1922—February, March, May,
July, August, October,
November, December.

1921—October, November, December.

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will surpass "The Informer" in the application of effect lighting. It is not so extreme as a whole, but in some respects it is more so. Several sequences invite August's most daring technique. He meets the issue wholeheartedly and confidently. You will want to appraise it.

Through his more than two decades as practitioner of cinematographic arts, August has succeeded in retaining his original rugged pioneer spirit. Seasonable modes of photographic urbanity have failed to dim his artistic creative force. He dares to forge ahead. In result, his contributions to the world's film fare are never guilty of pale mediocrity. He is never commonplace. His works are not rubber stamps in celluloid.

Professional critics may dislike his works cordially or like them to resounding applause, according to individual tastes. There is no drab middle ground; his unbridled virility and boldness of artistic expression forbid any such indifference. But as for audiences, they are the staunch advocates of his talented technique. With no exceptions, they are captivated by his winning photographic charm, his appealing simplicity and directness, his uncanny genius at presenting to their sophisticated vision pictorial dramatics that are appealing in their flights of polished modernity. And that, after all, is the sought-for cinematographic criterion.

Cinematographic Working Conditions in London

Continued from page 241

come taxes to meet. However, if you are away a full calendar year, you pay the British tax only.

All factors considered, London is entitled to fullest measure of praise for the progress made and being made in its picture production. Comparisons of London to Hollywood are by no means depreciatory to the older country. We have been making pictures on a big scale for twenty-five years. They have been at it in intensive fashion, for only three or four years. They haven't the knowledge that comes only from experience, nor should be expected to have it. But they are learning and progressing fast. And they are coming to headquarters—Hollywood—to gain the knowledge and equipment they need.

"Things To Come" has been widely heralded as an outstanding example of what England can deliver. Effectiveness of "trick photography," as the press refers to it, has been trumpeted loudly. Yet, Hollywood is mainly responsible. Ned Man Special Effects and a local lad, Lawrence Butler, made the miniatures. Another local product, Jock Thomas, did the optical work which is so spectacular, particularly in the television scenes. And I did the camera work.

I mention this without detracting in the slightest from the fine sketches of

sets drawn by William Menzies and Vincent Korda, both well known here.

On another picture, "Skylarks," I made the projection backgrounds, the air shots and also the straight production scenes. Cinematography has not become so specialized as with us.

There is little production elsewhere in Europe. The trade doesn't take very seriously Mussolini's threat to build another Hollywood in Italy. More attention is given Russia. That government is said to be building a picture plant on the Black Sea at an outlay of sixty-one million dollars—which is important money in any language.

I believe the several Hollywood cinematographers and the many technicians

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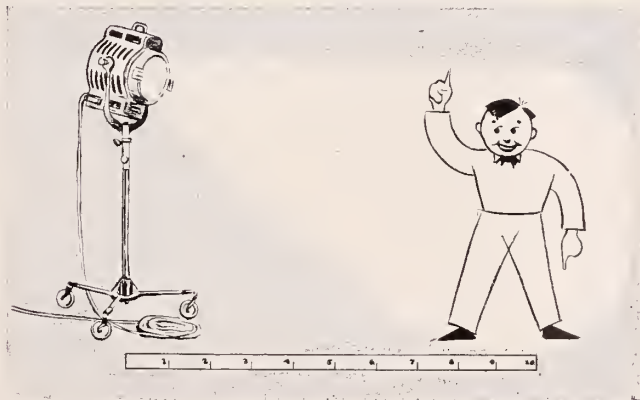
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who have gone to London find their work in the new field interesting and very enjoyable. I did. If you consider such an undertaking, have conditions clearly set forth in your contract before leaving. Your contract will be as good as a bond; there's no legal finagling in England. The studio will arrange your labor permit and probably pay your income tax. Kordo even placed a studio car at my disposal, taking me to and from the studio and my hotel. That, at least, is one item of service we don't get in Hollywood.

Main Elements of a Successful Picture

Continued from page 244

Consistency in viewpoint is the keynote of a successful picture. In "Modern Times" Chaplin is the story-viewpoint and this viewpoint should have been adhered to without interruptions. This would have brought the "gamin" to a secondary level, where it belonged, and the audience would have had a chance of giving their sympathy primarily to Chaplin, and secondarily to Goddard. As it is now in the picture the audience does not know whom to give their sympathy to first, then it is demanded from them that they split their sympathy in equal parts and bestow it simultaneously on Chaplin and Goddard. This naturally confuses the audience, leaves them up in the air and consequently "gets their goat."

To correct this the whole sequence of the "gamin's" introduction in the bonona-swiping scene and its following scene at her home with the father should have been discarded entirely, and the introduction be postponed to the moment where Chaplin tries to shield the girl by saying that he stole the bread. This would have been the logical place for the introduction of the "street-gamin" into Chaplin's life (screen-story) inasmuch as this is correct as to story's viewpoint: Chaplin, and the audience would have loved the character of Chaplin still more because they themselves could have imagined themselves in his place and taking pity on the poor starved girl, thereby cementing firmly the contact between screen (story-characters, etc.) and audience, and not, as it stands now, be allowed to become disconnected and without support.

Chaplin's pictures are definitely Chaplin and any forced re-adjustment of viewpoint or splitting of viewpoint spells doom for the picture which was clearly demonstrated by "Modern Times" by giving the character of the girl too much importance.

A re-arranging of scenes and a discarding of others in order to adhere without interruption to Chaplin's viewpoint would have sent the audience home in a pleasant mood. As it stands now, far the majority of the people the picture lost

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its grip right after the fade-out of the scene where Charlie is carted away in the ambulance.

The above-mentioned three points are the fundamental wrongs of "Modern Times" and without proper foundations everything else is so much wasted effort and falls by the wayside, failing to satisfy the audiences who voice an adverse opinion on the picture, thereby discouraging those who have not seen it yet, and the result is an indifferent box-office reception.

Supplying Power for Location Lighting

Continued from page 238

of two separate cores of six sections each, connected to headers at top and bottom. The cores are separated by a two-inch air-space. Air is forced through the radiator by a large, three-bladed aerodynamic fan which is driven by a variable-speed motor supplied with current from the main generator. It is possible to maintain the water-temperature at the most satisfactory temperature for efficient operation (180° F.) by varying the speed of the fan independent of engine or generator speed.

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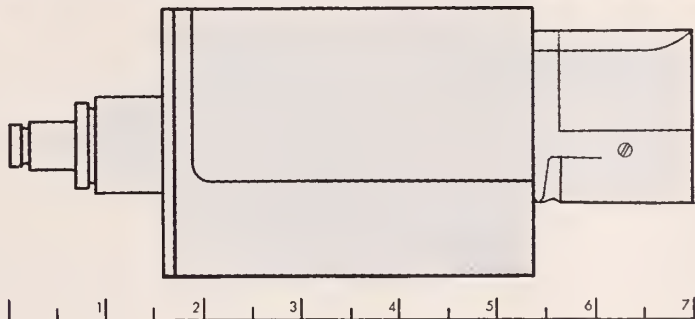
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of the exhaust manifold passes through the generator and radiator compartment—a fact which simplifies the matter of cooling. Three primary mufflers of large capacity are located in a separate compartment above the engine, and from these mufflers, tail-pipes carry the exhaust through secondary sound-absorbers which reduce the exhaust-noise to a very low level.

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When Cinematographers Were 24-Sheeted

Continued from page 240

Yet, I know cinema photographers of great professional talents and abilities being addressed in the casual title, "cameraman." Outside of trade and technical reviews, little notice is accorded his work by critics of the press.

I am wondering if we haven't rather neglected the cinematographer in recent years. With emphasis placed on the newer phases of picture making—all of them essential, I grant you—haven't we in degree forgotten that after all is said and done we are still dealing with photographed pictures? For it still is the photographer who takes all the assembled film arts and transmits them to the public via the thousands of little pictures he puts in his "box."

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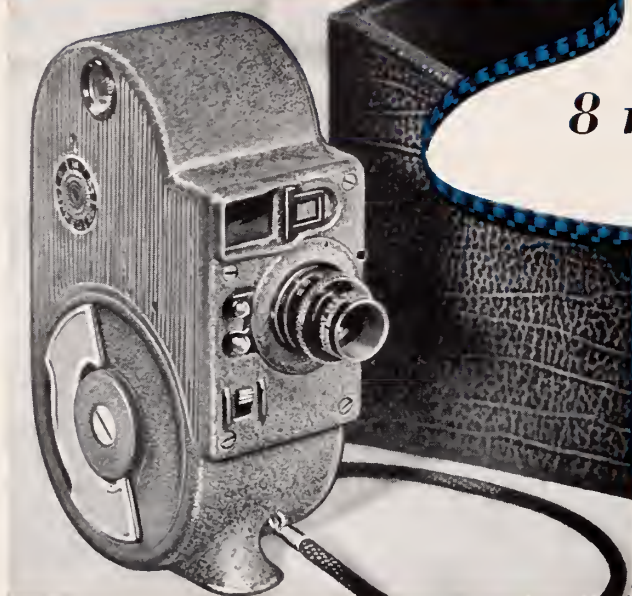
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AMATEUR MOVIES

this issue

Annual Movie Party . .
Camera the Ball Game
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Can Amateurs Imitate Professionals?
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. . . and other features

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AMATEUR MOVIE SECTION

Contents . . .

MOVIE PARTY Becomes Annual Society Event By Harry Burdick.....	258
TAKE YOUR Camera to the Ball Game By Barry Staley.....	259
EUROPEAN Method of Revising Cine Film.....	260
CAN AMATEURS Imitate Professional Tricks? By John F. Seitz, A.S.C.....	261
CAMERA ANGLES Are What You Make Them By Walter Blonchord.....	262
FILMING An Industrial Document By Walloce Block.....	263
WHEELS of Industry.....	264

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Movie Party Becomes Annual Society Event

by
Harry Burdick

FOR NOTABLE originality and ingenuity, the amateur cinematographer is unsurpassed. Whether camera and film inspire these qualities or whether those equipped with these traits naturally drift to movie making is as unanswered as the query covering the prior arrival of the hen or the egg. Instances of the creative trend are legend. Witness the countless gadgets, the completed films—and now a Movie Party which has come to be an annual institution of such interest that daily papers in New York and Paris gave it prominent mention.

The idea was born quite casually, as is the case with so many things worth while. Duncan MacD. Little is an insurance broker and amateur filmer of New York. Seven years ago, some friends were going abroad. He gave a bon voyage party for them at his West 67th Street home. As entertainment he screened a number of films he had made while abroad the previous year.

The following April, one of those friends had brought home several reels of scenic beauty above the average personal travelogue. Little had discovered several others of his friends who were as enthusiastic film-makers as he. So an evening of community screening was arranged. The invitations designated it the Second Annual Movie Party. That set the precedent for an annual event that friends will not let him forget or omit, nor does he want to forget.

Upwards of seventy-five guests attended his Seventh Annual Movie Party held April fourth of this year. Ten films were exhibited, eight of them lensed and edited by guests. Selection of these films was accomplished with a maximum of diplomacy.

Each invited guest was asked to submit a film two weeks in advance. Then Little turned the selection of the evening's program over to a committee. These judges were Frank S. Nugent, film critic of *The New York Times*; Miss Eileen Creelman, critic of *The Sun*, and Wladyslaw T. Benda, artist and creator of the "Benda Masks."

The reviewing was absolutely impartial. No effort was made to determine the films of highest merit. There were no prizes or awards. The selections were made only with the view of presenting the best available entertaining and balanced program of proper length.

Of the ten shown, four were films of travel taken by L. L. Hanel, Charles R. McLendon, Irving W. Lyon and Gwladys W. Sills. Four were in color by Edward K. Warren, Mr. Little, Berton J. Delmhorst and Paul E. Vernon. Then came two prize-winning films from the 1935 International Contest sponsored by the American Society of Cinematographers; "Happy Day," by T. Lawrensan, Dundee, Scotland, first award in the Home Movie Class, and "In the Beginning," by Fred C. Ells, Yokohama, Japan, runner up for the Grand Prize. The party was well planned. The seating was arranged, with tickets, programs, ushers and a projection staff. Two projectors were worked, with a third in readiness should anything happen to one. There was an additional projector for sound. Musical backgrounds were added to most of the films by means of a double turntable phonograph. Where needed, comments could be interjected by the aid of a microphone. Lights in the "auditorium" were controlled from the "projection room," which had a staff of three.

Projection was continuous, with awkward delays for threading and rewinding eliminated.

During the seven annual parties, films of many subjects have been shown. Travelogues, as would be expected, have

been in preponderance. But there have been other absorbing topics; melodramas, international sports events, semi-industrials, comedies, African hunting, archaeological discoveries, current historicals and events of local interest. Two "scaops" have been included. One was the start of Amelia Earhart's famous flight, which no newsreel secured, and the first sailing of the United States Liner "Manhattan," which was filmed from the pierhead in New York during a downpour of rain at midnight.

Travel views have been so far afield as Norway and the Arctic Sea, India, Morocco, Africa and interior by-ways of Spain.

Twelve of the guests have attended each of the parties. Of course, the capacity of Little's home limits the invitations and then, only active movie makers are invited.

The Fifth Annual Movie Party, in 1934, resulted in the present plan of selecting the evening's program. In that year, all guests were invited to bring a film to be screened. The projectors turned far into the night. Next year, only a few were asked for film. The current idea of outside judges insures a wider range of subject matter for selection and removes the program from individual preferences.

One extremely interesting situation came up. At one of the parties, two films by different amateurs of the same places were shown. Both were good, but the point of special interest was to note the different results achieved by the two men. Their personalities differed as day from night, and so did their films.

The success that has attended these Movie Parties to the dignity of becoming one of New York's looked-for social affairs is due not alone to Little's cinematographic enthusiasm and originality but also to a loyal group of friends. Long ago, the parties passed beyond the one-man class. This year, eleven of the group, in addition to the judges, collaborated in receiving, ushering, projecting and the music.

A printed program that transcends amateur limits is distributed to the guests to aid in their enjoyment of the evening, the establishment of "credits" and as a lasting souvenir of the occasion. Its gay spirit is reflected by this sample "advertisement":

MAKE THOSE GOOD FILMS BETTER SURPRISING! USEFUL FORMULA

Many enthusiasts nowadays develop their own films. This is a most laudable business and I have not a word to say against it. It is, however, somewhat of a strain and I would strongly recommend the following preliminary solution:

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This should be mixed in a glass vessel at a temperature

Continued on page 272



SCENE 6: LONG SHOT. Junior, at bat, in foreground. The youthful pitcher winds up and pitches.

SCENE 7: CLOSE SHOT of Junior at bat, awaiting the pitch. He swings vigorously, missing.

SCENE 8: CLOSE-UP of the young catcher, grinning and showing Junior the ball snuggling in his mitt.

SCENE 9: MEDIUM SHOT of Father, disappointed in his homer. He comes in to Junior and imparts a bit of fatherly coaching.

SCENE 10: CLOSE SHOT of the pitcher delivering the ball.

SCENE 11: MEDIUM SHOT of Junior at bat, Father close by. Junior swings mightily at the ball and again misses. Meantime, Father has been swinging; in imagination walloping one over the fence. At the miss, he again comes in to Junior, shows him how to hold and swing the bat; stands off and gives demonstration. With encouraging pat on Junior's back, Father withdraws to sidelines.

SCENE 12: CLOSE SHOT of the pitcher pitching.

SCENE 13: CLOSE-UP of Junior at bat. Grim determination is written on his face.

SCENE 14: CLOSE-UP. Father yells "Hit it!" in best bleacher fashion and registers keen disappointment at the outcome.

SCENE 15: CLOSE SHOT of Junior's third strike.

Take Your Camera to the Ball Game

by
Barry Staley

SUMMER BRINGS vacations, play days, bright sunny light for cameras—and baseball. Sandlot games are in progress everywhere with youngsters endeavoring to emulate their heroes of the diamond. These impromptu affairs between sides chosen on the spot, played on the nearest open space and with total disregard for adjacent window-glass, are so typically a part of the American scene that this era of your boy's athletic development should by all means be made subject for a film.

Father, proud of his own athletic prowess in years torn from the calendar, can well be brought into the story to give it entertainment value and the inevitable humorous moral.

Gather a few young lads in the neighborhood and have them get under way one of their own conceptions of how baseball should be played. Stage it in a handy vacant lot or parkway. This scenario will serve as a skeleton for your picture.

MAIN TITLE: THE BIG LEAGUER.

SCENE 1: LONG SHOT of Father walking along sidewalk on his way home, directly into camera.

SCENE 2: LONG SHOT of baseball game in progress on vacant lot. Father walks into scene on sidewalk in foreground; stops and watches.

SCENE 3: MEDIUM SHOT of Father watching the game. Junior, bat in hand, runs in to him from the game and greets Father.

SCENE 4: CLOSE SHOT of Father and Junior. Junior beckons Father to come and watch the game. It's Junior's turn at bat.

SCENE 5: MEDIUM SHOT. Father and Junior entering the scene of conflict. Junior takes his batting stance at home plate. Father is nearby on the sidelines proudly awaiting big things—a home run, at least.

SCENE 16: MEDIUM SHOT as Father steps briskly in to Junior, takes his bat and proceeds to show his offspring how homers are screamed to the far distance.

SCENE 17: CLOSE SHOT. Father, with bat, is warming up, wagging the bat and taking several husky swings. He indicates to the pitcher that he is ready and motions the fielders back.

SCENE 18: CLOSE-UP. The catcher signals his pitcher, sending along a sly and knowing wink.

SCENE 19: CLOSE-UP. The pitcher acknowledges the signal and the wink, smiling knowingly behind his glove.

SCENE 20: CLOSE-UP. Father. Happily confident. This is just like old times.

SCENE 21: MEDIUM SHOT. Father, in foreground, and pitcher. Junior is watching closely at Father's request. Comes the pitch. Father takes a massive roundhouse swing—and misses.

SCENE 22: CLOSE SHOT. Father turns to catcher, unbelieving. Catcher seriously reassures him by exhibiting the ball. As Father turns catcher throws ball to pitcher, again with his sly wink.

SCENE 23: MEDIUM SHOT. Father at the plate. He

Continued on page 270

European Method of Reversing Cine Films

Editor's Note: The formula and instructions reprinted on this page are recommended by Gaevent to the European users of their film. Across the Atlantic film is sold with and without processing privileges and instructions such as given below are furnished the users of the various makes of film. Those familiar with the processing of reversal film will realize from the formula given that if positive were used the prints would be very contrasty; it might work reasonably well in the reversing of negative, which is usually very soft. We have not tried out this formula and reprint it merely as a matter of interest to those who have their own laboratory.

THE COMPLETE manipulation and processing of a film by this method requires only about one hour. If the baths can be employed several times, the cost of processing is kept to a minimum.

First Development: The exposed film should be developed to the full, until the high-lights are well visible as black on the back of the film and certain details also can be seen. For films which have received normal exposure it may be reckoned that development time of about 10 minutes at a temperature of 68 deg. F (20 deg. C) will be correct. Practical tests have shown that temperature even up to 80 deg. F. (27 deg. C) is without harmful effect on the film.

The Watkins factor of the developer given below is 8, that is to say the time of appearance of the first details of the image is multiplied by 8 in order to give the total time of development of the film. For example, if the time of appearance of the first signs of the image is 60 seconds, the film must be developed for 60x8=480 secs., that is to say, 8 minutes.

Solution No. 1

Hydroquinone	90 grs.	10 gms.
Soda sulphite, anhydrous.....	615 grs.	70 gms.
Soda carbonate, anhydrous	305 grs.	35 gms.
Potass Bromide	70 grs.	8 gms.
Hypo (ordinary Fixing Hypo).....	18 grs.	2 gms.
Water	20 ozs.	1000 ccs.

Solution No. 2

Caustic potash (KHO) stick.....	2 ozs.	100 gms.
Water	20 ozs.	1000 ccs.

The separate solutions keep indefinitely. To make the working developer, 9½ parts of Solution No. 1 should be mixed with ½ part of solution No. 2.

Washing: For 5 minutes.

Reversal (removing silver image): This is done in a bichromate bath made by mixing one part of the stock solution given below with 5 parts of water. This bath may be used until completely exhausted. The removal of the silver image takes place in 5 to 10 minutes, and the operation must be continued until the whole of the black silver deposit is dissolved away.

Potass bichromate	260 grs.	30 gms.
Sulphuric acid (66° Be).....	5¼ drams or 1 oz.	33 ccs.
		or 50 gms.
Water	20 ozs.	1000 ccs.

After the film has been in this bath for 2 minutes, subsequent treatment may be done by white light of a uniform intensity, preferably reflected light.

Although the quantity of white light falling on the film during the second exposure is without effect on the final result, excessive light is nevertheless to be avoided, otherwise the tone obtained during the second development is liable to be too warm. It is advisable to employ a light of 60 to 100 c.p. at a distance of about 3 ft.

Washing: For 5 minutes.

Bleaching: This is done in a 10 per cent solution of anhydrous soda sulphite. This bath can be used until exhausted. The yellow colour should disappear completely in this bath and the film should be of the original colour of the emulsion.

Washing: For 5 minutes.

Darkening: This operation is carried out by second development in the following bath:

Metol	18 grs.	2 gms.
Soda sulphite, anhydrous.....	175 grs.	20 gms.
Hydroquinone	26 grs.	3 gms.
Soda carbonate, anhydrous.....	175 grs.	20 gms.
Potass bromide	18 grs.	2 gms.
Water	20 ozs.	1000 ccs.

Treatment in this bath is stopped as soon as the desired degree of darkening is obtained.

Fixing: For 5 minutes in an ordinary acid fixing bath.

Washing: Wash thoroughly for half an hour.

General Note: For production of perfect results it is of the utmost importance that all the operations should be done in a perfect clean place, and all the tanks and other containers should be kept scrupulously clean. Also the various baths should be filtered before use. It is also advisable to filter the washing-water.

Chief Defects Due to Wrong Manipulation: 1. The film, after reversal, is black or fogged. This defect results from the first development, which has not been continued far enough. In this stage of the process the film must be developed "to finality," that is to say, until the highlights show black on the back of the film. If this is not done a larger or smaller proportion of the silver salt which was exposed to light in the camera is not developed and thus cannot be removed by the reversing bath. These silver salts are darkened in the second developing, or darkening, bath and thus give rise to more or less pronounced fog in the high-lights of the finished film.

2. The reversed film shows a band which is lighter than the rest in the middle (under the perforations): This defect (which of course occurs only in 9.5mm film, in which the perforations are in the middle), is due to the fact that in the first development the developing action is more pronounced in the parts under the perforations, since in these parts the bath which is in contact with the film is more actively renewed on account of the current of liquid which takes place through the perforations. Thus following the first development, a darker band is obtained in the middle of the film, this band becoming lighter than the remainder when the film is reversed.

When developing on drums, this effect does not occur at a particular speed of revolving of the drum—a speed which should be determined by experiments. As a general rule a circumferential speed of about 120 ft. per minute is suitable. If the speed falls below this figure, the effect described above is liable to occur.

When developing on frames, this defect can be avoided by reversing the frame at sufficiently frequent intervals, also

Continued on page 272



Can Amateurs Imitate Professional Tricks?

by

John F. Seitz, A.S.C.

AFTER THE RELEASE of every picture, the professional cinematographer's mail swells with letters asking, "Can I reproduce this effect or that trick in my home movies?" Sometimes our replies can be reassuringly affirmative; at other times, the only honest reply is a regretful "no". Such effects as filtering, diffusion and lighting can almost always be duplicated, or at least closely imitated, with amateur equipment. On the other hand, many of the most interesting tricks—the sort known professionally as "special process shots"—are difficult, if not impossible to duplicate in home movies, for their making involves special equipment unknown to standard filming, and precise workmanship which not even cine-micrographers exceed. But on rare occasions, we make a special-effects shot which is not beyond the range of the expert home filmer.

Such a shot appeared in a film I made recently, "Curly

Top," which starred Shirley Temple. It—or rather several similar shots—appeared in a sequence in which Shirley's intended foster father is viewing his collection of famous paintings. As he looks at each of them, the painting comes to life, revealing Shirley, who smiles, bows or waves to him. Since the picture has been released, I have received a number of letters asking two questions: how was the trick done? And how can it be imitated in home movies?

There are quite a number of ways it can be done, either professionally, or otherwise. One method, for instance, would be by optical printing. Another method would be the use of the projected background process. In this case, the picture frame would contain only a ground glass screen, upon which would be projected (from behind) a film showing the painting which would come to life at the appropriate moment. The camera and projector would be electrically interlocked, so that their shutters operated together. The background "plate," of course, would be made separately, and would be quite a simple shot.

As it actually happened, we used neither of these methods. Instead, we made it without any recourse to "trick" photography in the general sense of the word. Each of the "paintings" was made like a little stage. The "scenery" was simply a reproduction of the background of the famous painting to be reproduced. In front of the "painting," in its proper place in the frame, was a pane of glass which had been carefully smudged with oil to give a suggestion of the texture of the painting. When we made the shot, Shirley, in the proper costume, took her place behind the glass, and became a figure in the painting. As she is a well-trained little actress, she had little trouble in taking the pose of the painted figure, and holding it until the time came for her to move. Then she went through her action, and once more became a painted figure. It was beautifully simple, wasn't it?

And the same idea would work perfectly well in an amateur picture—if one cares to go to the trouble and expense of fitting up life-sized paintings in this way.

But from my own home movie-making experience, I've an idea that most of the 16 and 8 brigade will prefer to adapt this trick on a smaller scale. One of my correspondents, Harold P. Roberts, of Akron, Ohio, writes that he would like to apply the idea to one of his films, using a snapshot album instead of a painting for the "picture." He suggests doing it by reflection: beginning with a medium close-up of the actual picture in the album, stopping the camera while the picture is covered with an unframed mirror which will catch the reflection of the pose to be animated, uncovering the lens, and shooting the rest of the scene.

This idea will work quite successfully. But it has two drawbacks. First of all, there will be some very nice problems in angles and reflection to deal with. Photographing reflected images in mirrors is not difficult, but it is unfamiliar territory to many home-filmmers, and very few substandard cameras are equipped to sight through the lens, in actual shooting position—a thing which is quite important in such close work as this. Secondly, this method will rather restrict your choice of subjects and locations for the picture that is to come to life. And it will not be at all easy to line up the original "still" with the reflection, so that they blend into each other without a "jump," or a change in size.

Stop-motion background projection will not only minimize this problem, but will enable you to use any scene you wish for the trick. The album is cut away, and in the picture's place—preferably slightly inset, so that no front-light falls upon it—is a sheet of fine ground glass.

Continued on page 269



"Camera-Angles" Are What You Make Them

by
Walter Blanchard

IF YOU expect this to be one of those "arty" discussions of the esthetic importance of those weird camera-angles unappreciative filmers designate as "screwy," you're doomed to disappointment. To me, a bizarre angle is, nine times out of ten, simply an indication that somebody didn't know how to set his camera level. But, quite aside from this rather sophomoric conception, the matter of camera-angles is a mighty fundamental part of the practical task of getting good pictures.

Essentially, the term "camera angle" refers to the position of the camera with relation to what is being photographed. There is—or should be—a definite relationship between the subject, the type of action, and the position of the camera.

The most elementary distinction in camera-angles is between the long-shot, the medium-shot and the close-up. Of course, if you want to split technical hairs, you might name a flock of sub-varieties of each of these; but essentially, you'll still be dealing with close-up, medium-shot and long-shot. The long-shot is made with the camera far enough

away from the subject so that the whole thing—subject and background—is fully shown in the picture. The medium-shot brings the camera closer—say close enough so that if you're filming people, you show about half the figure. The close-up takes both the camera and the audience close to the subject, so that if you're photographing a person, you fill the screen with his head and shoulders, or perhaps merely the head alone.

But that's kindergarten stuff; everybody knows what these shots are. Not so many, though, seem to know how to use them.

Well, in a long-shot, we show everything. If we're photographing people we show the people, and where they are in relation to their surroundings. In a medium-shot, we've moved up closer, to where we can get a better view of what's going on. In a close-up, we've brought our subject within arm's length.

It is almost invariably best to open a sequence with a long-shot. This "plants" the geography of the scene in the minds of the audience: and you've got to remember in any kind of film that although you, who made the picture, may have a clear idea of the general layout of the locale, your audience, like Sharlie, "vasn't dere"—and they probably won't be familiar with the arrangement of the place or the room. A good long-shot, held for a fair footage at the beginning of the sequence, will tell them where it is, and what it's like.

But in a long-shot you can't very well see the details of the scene, or follow the details of the action. If you want these details in real life, you move up closer. A medium-shot does this for the camera.

There are times when ordinary close approach is not enough to show you the important detail of any thing or action. Then, in actuality, you try to get within arm's length of whatever you're looking at, and get a close-up of it. That's the close-up's primary function in movies.

Now, to bring this discussion to a more practical plane, suppose we're making a vacation-movie in Zion National Park. Still supposing, let's say we open with a pictorial long-shot of the Great White Throne. It shows the scene perfectly, including, in the middle distance, a car with some people around it. We don't know who they are, or what they're doing, but there they are. A medium-shot could follow, and show that they were Cousin Dick and his brother-in-law, and that Dick was doing something to the car. Coming nearer, for a close-up, we learn that Dick is changing a tire. And if we want to come to an extreme, big-head close-up, we can prove that Richard is perspiring copiously!

The same thing applies to scenes in which we are more interested in what is being done, than we are in who is doing it. Suppose instead of Cousin Dick, we have an expert service-man at work: the long-shot shows where he is; the medium-shot shows who he is and what he's doing; and the close-up shows how expertly he's doing it.

Just which of these angles is best for any given scene can usually be determined by the idea we're trying to get across to the folks who see the film. If that idea is "where" or "what," the longer shots are best; if it is "who" or "how," closer shots are vital. Filming a big league ball game, only a long-shot will show it's the Yankee Stadium or the Polo Grounds—but only a close-up will prove that it's Jimmie Foxx batting, or show how he bats.

This business of picking camera-angles can do a lot more than this, however. How often have you seen pictures of people in dark clothes carefully posed in front of dark green shrubbery—or folks in light garments merged into light-colored backgrounds? Nine times out of ten, a little thought

Continued on page 268

Filming an Industrial Document

by
Wallace Black

IF YOU are looking for a "different" film-subject, why not focus on your own business?

Regardless of what that business may be, there is a good picture in it. A picture which you can make better than anyone else, and which will be genuinely interesting to any audience. It can be as long or as short, as intricate or as simple as you care to make it. And most assuredly, it will be something different from the general run of home movies.

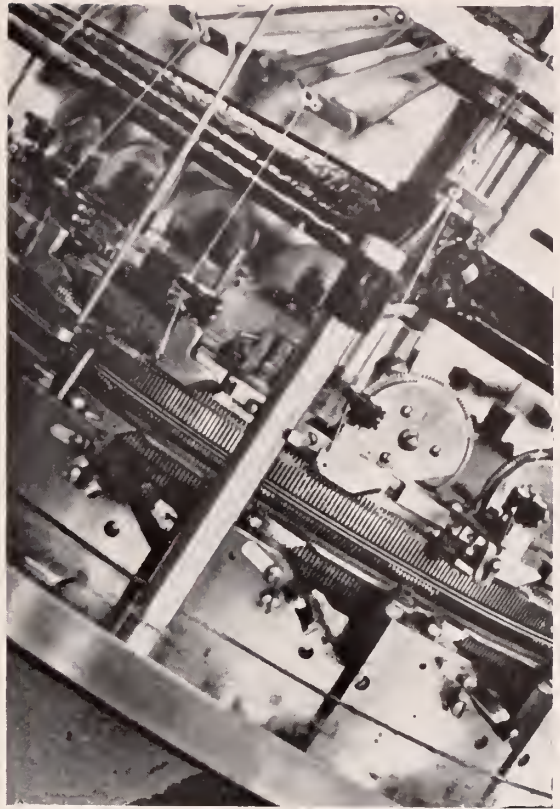
Most businesses have more than a single story to tell, so the first step in making an industrial film is to decide which of them your camera is to relate. Let's say our business is one of manufacturing; shall we show the product in action, shall we show how it is made, or shall we narrow our field down to some specialized phase of the product's manufacture or use? Every one of these approaches will lead to a good picture. Each is a complete story in itself.

Once this matter is decided, the next thing to do is to decide how we are going to tell the story we've chosen. There are quite a number of ways. We can, for instance, work up a dramatic story around the subject; one of the most natural ways to do this is to make one of your actors a visitor to the plant, and the other some member of the firm who is showing him around. The "visitor" can ask the questions which the audience will naturally be asking, and the "host" (aided by close-ups and cutbacks) can answer them in words and pictures.

But this treatment takes quite a bit of footage, and—as everyone who has essayed a substandard drama knows—it calls for careful planning and staging if the picture is to be a success. Most amateur actors, too, leave something to be desired.

A simpler, and really more effective method is to ignore the human element entirely, concentrating on the factual story of how the product evolves from raw materials and blueprints to its finished form. This is by far the best course for the amateur industrial filmer, for not only is such a picture simpler to make, but more telling, since there are no non-essentials to distract the attention of the maker or the viewer of the film.

Cinematically speaking, there are two styles which one may follow in realizing a film of this type. Obviously, the first style is simple, straightforward camera-reporting. In this, your scenes will consist simply of what a normal visitor to the plant would see as he walked along. Most of the story would be told in long and medium shots, showing the craftsmen and their machines at work, just as you would actually see them. Close-ups would be necessary only to show things where an actual visitor would stop and look closer to follow some significant detail. Nar-



An unusual camera-angle adds pictorial interest to this close-up of a knitting machine. Photo by P. M. Chancellor, A.S.C.

rative titles would explain things, just as in reality your guide would explain them verbally.

Much more interesting, however, is the film which tells the same story with dramatic technique, using the manufacturing process itself as the star, with little or no intrusion of the human element. This sort of a picture can be done almost entirely in close-ups, and made artistically interesting by means of unusual camera-angles and lightings. This treatment, carried out expertly, can eliminate the need for most titles; animation and stop-motion shots can add novelty, and illustrate processes of assembly, etc., which might not be easily understood otherwise.

These various styles have all been used successfully in amateur-made industrial pictures. Not long ago, for instance, I saw a 16mm film which began by starting two young couples off on a vacation in California's Sierra Nevada mountains. Reaching their destination, they discovered that they were in the heart of the gold-mining district. Naturally, they tried their hands at placer mining with pick and pan. While they were doing this, they fell in with a young mining engineer, who showed them through several of the nearby mines, and told them how gold was dug and refined, and what an intricate, expensive process commercial gold-mining has become.

One of the entries in one of the American Cinematographer Amateur Movie Making Contests was one made by an official of the Illinois Public Health Service, and showed how the milk supply of a big city is protected. Milk, from the cow to the table, was the star of this production. Human actors there were, but they were merely "extras", milking cows, hauling milk cans, making bacteriological tests, and the like.

Another notable Contest entry was a film which told of the making of locks. It was told almost entirely in close-

Continued on page 270



WHEELS

OF INDUSTRY

Fotoshop Expands

● One thousand square feet of space on the fifth floor of the same building in which the store is located was fitted up by Fotoshop with automatic printing, developing and enlarging machinery for the processing of still and motion pictures.

Rolleiflex Mogozine

● According to an announcement from Burleigh Brooks, the popular Rolleiflex Magazine published in Germany will be translated and issued in this country. The first edition is now off the press.

8mm Kodachrome

● Kodachrome for Cine-Kodak Eight is announced by the Eastman Kodak Co.

As most 8mm film users have probably learned by now from their experience with black-and-white Cine-Kodak Eight Film, the most effective results are obtained in fairly close views; that is, pictures made from 2 to 25 feet from the subject. This does not mean that you will not be able to make distance shots with Cine-Kodak Eight Kodachrome Film. The colors of objects are more apparent when near by, so are Kodachrome movies of objects clearer and more pleasing when your subjects are relatively near the camera.

Cine-Kodak Eight Kodachrome requires a slightly larger aperture than Cine-Kodak Eight "Pan" Film.

Wolf Frome Counter

(For Victor Cameras; model 3, model 4, and model 5)

● The Single-Frame Counter is devised to assure absolute correct counting of the number of frames exposed, and wound back.

A spring-steel bracket, on which is mounted a gear, is slipped over the spring housing of the camera, and a small gear is attached to the winding shaft. Both gears are then in mesh and synchronized with the mechanism of the camera. When the film is running, the dial rotates, while the hand on the dial remains stationary. The hand may be set at "Start" or at any number of the dial, as required.

The camera spring may be wound up without removing any part of the device.

Photomicrography

● The American Photographic Publishing Company has just published a book of over 200 pages, under the title of, "The Student's Manual of Microscopic Technique With Instructions for Photomicrography." This opus was authored by J. Carroll Tobias, and sells for \$2.50.

A very comprehensive chapter is given over to the use of the camera with the microscope. It explains set-ups, lighting, focusing and other important details for those who do this type of photography.

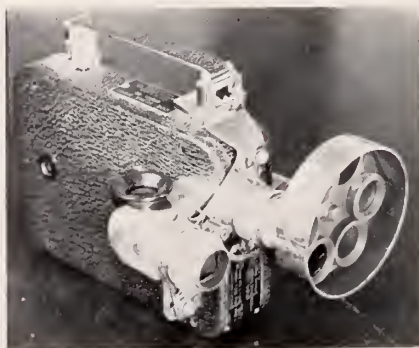
P. A. Projector

● Victor Animatograph Corporation, Davenport, Iowa, manufacturers of 16mm motion picture equipment, announce that 24B Sound-on-Film Projector can now be equipped with a small pre-amplifier which, when used with a velocity ribbon microphone provides a public address system.

The pre-amplifier, which is a separate unit measuring 4½"x7½"x11" and weighing 6 lbs., plugs into a socket in the base of the Animatophone amplifier. This socket is being incorporated as a standard feature in current model 24B equipments. On 24B Animatophones already in use, the pre-amplifier socket will be built into the base of the Animatophone amplifier free of charge.

8mm Focus Device

● Wm. J. Grace, who has contributed many an ingenious accessory and adjunct to the various substandard cameras, submits the photo on this page of a focus device he has made for an 8mm Eastman camera. This requires two lenses and each lens interlocks so that the taking lens is focused automatically when the viewing lens is being focused.



Projector Cases

● The Motion Picture Screen & Accessories Co. of New York announces two new projector cases.

One, a case of the "Ever-Ready" type, is called the "De Luxe" model. The projector, during its performance, need not be removed from this case. The projector base fits snugly and firmly into the bottom of the case and cannot possibly wobble. Both sides of the case open flat.

Another model, manufactured by this company for the Kodascope E projector opens sideways enabling one to slide the projector from the case.

The specifications mention that the cases are of ½" kiln dried white pine with ¼" 3-ply veneer sides, nailed and glued and that interlocking corners provide for strength and durability. They are covered with brown, washable leatherette, have metal mountings and solid leather handles.

Reduces Price

● Wm. J. Grace of Texas, manufacturer of the famous Beltipod, and other handy accessories for the movie amateur, announces a one-third reduction in the price of the Beltipod. This piece of equipment formerly sold for \$7.50. The new price set by Grace is \$5.00. It has proved very handy to those who cannot take tripods into certain places for picturemaking. It not only helps to steady the picture, but has a free-acting tilt and pan arrangement.

New Kin-O-Lux Film

● Kin-O-Lux announces a new motion picture film for amateurs to be known as Kin-O-Lux No. 3.

This new film is described as high speed panchromatic. It is further claimed that No. 3 extends over the whole range of the visible spectrum. Also the announcement states the speed is about four times that of ordinary orthochromatic emulsion.

Among the special advantages claimed is that it is sensitive to yellow, red and green rays, with the red sensitivity greatly increased.

Continued on page 272



It's Ready

8 mm.

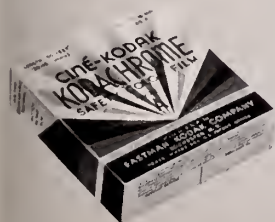
KODACHROME



**...and for 16 mm.
movie cameras**



The familiar Kodachrome Film for outdoor shots. 50-foot magazines, \$5; 50-foot rolls, \$4.75; 100-foot rolls, \$9.



The new Type A Kodachrome for artificial light needs no filter, requires far less light, is priced the same.

CINÉ-KODAK Eight Kodachrome is here—with all of the colorful charm and realism of its 16 mm. contemporary . . . equally free from complexities of taking or showing.

Any Ciné-Kodak Eight, regardless of lens speed, without a single accessory, can now make full-color movies. Every "Eight" projector, unaltered, can show Kodachrome movies.

Filters Unnecessary

No filters are required for all ordinary shots. You simply load up with Ciné-Kodak Eight Kodachrome, sight and shoot as you have in the past for black-and-white movies—observing, of course, a few rules of exposure characteristic of Kodachrome filming—and make movies in all of the gorgeous colors of nature.

The projection of Kodachrome is every bit as trouble-free. You can splice color sequences right in with black-and-white, project them consecutively without even a single adjustment of your Kodascope. The color is in the film. And on the screen, as one movie maker expressed it, "It's like looking through a window at life." Smooth, even color—no lines, fringes, or pattern.

Your dealer has "Eight" Kodachrome for you now, packed with ample and comprehensive instructions, priced at \$3.75 per 25-foot roll—equivalent in projection time to the 100-foot 16 mm. roll.* See him today and add color to tomorrow's movies.

**At present Ciné-Kodak Eight Kodachrome is being processed at Rochester, N. Y., only.*

EASTMAN KODAK COMPANY, Rochester, N. Y.

A JUNIOR

for the Amateur

THE AMERICAN SOCIETY OF CINEMATOGRAPHERS has organized a junior branch of its association for the amateur to be known as the SOCIETY OF AMATEUR CINEMATOGRAPHERS.

FOR MANY YEARS amateurs have been requesting the American Society of Cinematographers to form an organization for them that would be representative, authoritative and instructive.

WHILE IT WOULD be easy to form such an organization in the spirit of enthusiasm that usually accompanies such pleas, but to insure the continuance of such an association it needs real ideals and a constructive policy.

THE SOCIETY OF Amateur Cinematographers is not a society to give to the amateur letters to be used after his name and it does not throw its membership open to everyone who has the fee to join. The Society of Amateur Cinematographers is based on strict and sensible requirements.

FIRST, THE APPLICANT must own a camera; second, he must have made motion pictures, and third, he must submit a picture to the reviewing board which is made up of members of the American Society of Cinematographers. This does not mean that the amateur is going to be judged by 100% professional standards as practically every member on the reviewing board operates either an 8mm or 16mm camera and is familiar with the shortcomings of the amateur's equipment.

WHEN AN AMATEUR has been admitted to the SOCIETY OF AMATEUR CINEMATOGRAPHERS, it is a sign of achievement; it is an indication that he is truly an amateur cinematographer, and he knows

SOCIETY

that his fellow members are active and accomplished amateurs. Also he is being guided by experts, by the acknowledged camera masters of the world, by Hollywood's greatest directors of photography.

MEMBERSHIP will include a subscription to the "American Cinematographer". It will also include the use of the outstanding films made by members of the Society of Amateur Cinematographers. As films are submitted, the best will be duplicated and an analysis prepared by a member of the American Society of Cinematographers. This analysis will go with the picture and the picture will be available to any member of the Society of Amateur Cinematographers.

FOR THE MOST outstanding members and the most able amateur cinematographers, a fellowship will be created, giving that amateur the title of Fellow of the Society of Amateur Cinematographers. Requirements for Fellowship will be announced later.

MEMBERSHIP IN THE SOCIETY of Amateur Cinematographers gives each member access to the film library, privilege of asking questions, and advice on all branches of movie making.


AS THE SOCIETY GROWS, it is the plan to create branches in other centers to be made up of members in those cities. In Hollywood a branch will be created and the programs originated here will go forward to other branches as a unit.

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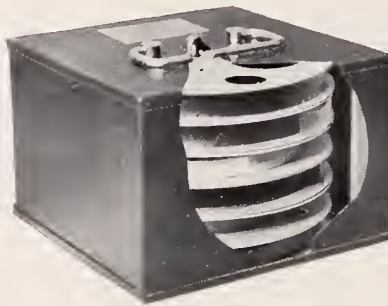


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312 WEST PAGE
EQUIPMENT AND APPARATUS
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normal speed, the shutter of the average home-movie camera gives an exposure of from 1/24 second to 1/40 second, depending on the type of camera you are using. This is hardly enough to "stop" really fast motion, so to get a satisfying, unblurred picture of a fast-moving object, we must resort to camera-angles. What actually causes the blur is not so much the actual speed of the object as the distance its image moves across the film during the exposure. If, for example, we are photographing an airplane, and choose a camera-angle in which the plane moves directly across the picture, it is obvious that during our 1/30 second exposure, the image of even a slow plane is going to move quite a bit across our frame. On the other hand, if we choose an angle at which the plane is moving toward the camera, its image won't spread itself over nearly as much of our frame during the exposure. Therefore, the best angle to use in getting shots of fast-moving objects of any kind is one at which they are coming toward the lens. In most cases, a 3/4-angle is best, but for very fast-moving objects, it is often necessary to shoot "head-on," to minimize the blur. But if it is not possible to get such an angle—if you must shoot full broadside-on—you can still minimize the blurriness by getting farther away from your subject. True, you will have a smaller picture of the thing, with a lot of background you may not particularly want, but since the image of the object is smaller, its movement across the frame will also be smaller, and the picture will be less blurred.

It's the same way in movies. If you want your audience to understand your scene quickly and easily, shoot your scenes from simple, "head-on" viewpoints. If the action is in itself clear enough to get itself understood, then—and only then—is it safe to use unusual viewpoints. If you've seen any of the

"Camera Angles" Are What You Make Them

Continued from page 262

of camera-angles—selecting an angle that offers a properly contrasting background—will save a world of projection-room apologies.

And there are other embarrassments that can be avoided by similar thought of the camera's viewpoint. The other day, for instance, a friend of mine proudly showed me a shot he had made of a famous actor. It was a nice shot, but it was just too bad that a nice, bushy palm tree in the background seemed to be growing straight out of Mr. Gable's head! Two steps to the right or left would have eliminated the Zulu head-ornament. Another chap showed me a scene in which his girl-friend walked from her front door across the lawn and

got into a car. She was really quite pretty—but I don't think she was nearly strong enough to do what the scene made her do: my friend shot straight across the lawn, and just as she entered the picture, a car went by on the cross-street at the corner—and the girl seemed to be pushing it before her like a baby carriage! Of course, only a professional movie trupe can control the traffic in the background and prevent inopportune cars from stealing the scene—but anyone can pick a camera-angle which does not show the cross-street.

The physical limitations of the amateur movie-camera must be considered in camera-angling on some types of action. Especially fast-moving action. At

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films of the great Russian directors, of whom the highbrows are always raving, you'll notice that in the course of ordinary action, they use trick angles only when the action is simple, direct, and easily understandable. The complicated action is always portrayed in a simple, straightforward way.

Of course, this principle works backward, too. If you have something intricate to show, which you want clearly comprehended, use simple angles: but if for any reason you want to confuse your audience (as in putting over the confusion of a big city, a nightmare, or 'a drop too much') remember the unusual angles. Your audience is sure to be confused. And if you do it well enough, the esthetes are quite likely to hail you as a master of the "new expressionism!"

Can Amateurs Imitate Professional Tricks?

Continued from page 261

Behind this is a projector; it need not be a powerful one.

To make the shot, you simply choose any scene you may wish for the "still," and thread it into the projector. Turn the projector's light on, with the shutter open, and the heat-absorbing "still projection" safety-shutter in place. With your camera, expose as much footage as you care to allow before the picture animates, one frame at a time. To make the projected picture start to move, simply pull the film in the projector down one frame between each frame-exposure made with the camera.

Lining up for a shot like this is simplicity itself. Thread the projector, and focus it on the screen. From the other side, focus the camera on the screen, framing your shot to include as much or as little of the bordering "album page" as you choose. This border, of course, will have to be lit from the front; otherwise, it will merely be silhouetted by the projected picture. At the same time, none of the rays that illuminate this "page" must strike the ground glass of the screen. For this purpose, a small spotlight is probably the ideal lamp, for it projects its beam directionally, and can be controlled accurately. If you haven't a spotlight, use a regular Photoflood floodlight, fitted with a conical concentrator, such as have so often been described here. The light, I think, would be most effective if it came from the side of the "page". A second lamp, well diffused, might be used from the other side, to avoid excessive contrast.

To completely reproduce the effect of a snapshot coming to life, the area immediately around the edge of the ground glass should be covered with white (or light gray) paper, to imitate the white border around most kodak prints.



LEICA PHOTO BY HANS KLOSS

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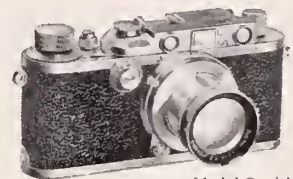
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This sort of a shot is necessarily a fairly close one. In some cases, it might not convey the idea of a snapshot in an album as completely as we could wish. If that happens, it is a simple matter to make a snapshot-size enlargement of the first frame of the "background plate", and mount it in a bona fide album. Then, in addition to long-shots of the character sitting down to look at the album, we can make a shot from over his shoulder, showing the real album in his hands, with the picture very evident in it. After this, cut to our "process shot" close up of the picture coming to life—and the effect will be very convincing.

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Filming an Industrial Document

Continued from page 263

ups; the only suggestion of human actors was an occasional glimpse of hands operating lathes and drills. And human players were not needed! Before your eyes the rods and sheets of metal were cut, shaped and moulded, taking mysterious form as parts of an intricate lock. When all were completed, they assembled themselves (thanks to stop-motion), and operated themselves to show you how they worked. I don't think there was a single explanatory title in the picture, for the action was so well planned and so completely shown, that no explanation was necessary. And the camerawork, which made generous use of unusual angles and striking effect-lightings, made the picture something which would in itself thrill any photographer's heart.

The technique of making these industrial films is not greatly different from that of making ordinary home-movies. Good photography is good photography, no matter what you are photographing. In industrial filming, however, you are more apt to encounter unfamiliar conditions: cramped space, limited time, and poor light-conditions are to be expected. But a good camera, a tripod, fast lenses, an exposure-meter, a good assortment of film with as many really efficient lamps (both of the stand and the clamp-on type) as you can get, should solve every problem. And, as much of this sort of work will have to be done under artificial light, a plentiful supply of extension-cord will prove valuable. For convenience, this cord should be fairly heavy, so that there won't be too much loss of current when your lamps are used for from the current outlet. A multiple outlet or junction-box at the end of this cable will be a very practical advantage, too.

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Take Your Camera to the Ball Game

Continued from page 259

is explaining his failure to Junior, who is taking it straight. Father grips his bat.

SCENE 24: CLOSE SHOT. Father at bat, poised for the pitch. He takes a terrific swipe at the ball. Strike two.

SCENE 25: MEDIUM SHOT. Father is again alibi-ing his miss to Junior, who is impressed. Off come Father's coat, vest, shirtsleeves are rolled up, necktie loosed and collar opened.

SCENE 26: CLOSE SHOT. Father is cautioning Junior to watch closely, to absorb the fine points of Father's batting technique.

SCENE 27: LONG SHOT as Father waves the fielders still further back and

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they move back as far as they can go. One, possibly, is perched on the fence to catch a soaring liner.

SCENE 28: MEDIUM SHOT. The pitcher uncorks an elaborate wind-up and lets the ball come. Father energetically wagging his bat.

SCENE 29: CLOSE MEDIUM SHOT as Father swings at the ball. Again missing. The force of his swing turns him about and spins him from his feet.

SCENE 30: MEDIUM SHOT. Father is rising from ground, dusting off his trousers. Catcher holds the ball high. Junior is very serious. Another youngster comes in, picks up the bat and steps to the plate.

SCENE 31: MEDIUM SHOT of Father composing himself. Junior is solicitous. The batter, of pint size, hits out a long one. Father watches it fade in the distance, amazed.

SCENE 32: LONG SHOT. The game carries on, Father's interruption forgotten. Junior is back in the game. No one pays any attention to Father. He gathers his coat and vest and steals away.

SCENE 33: MEDIUM SHOT. PANNING on Father as he slowly walks along sidewalk. He is limping slightly. FADE OUT.

SCENE 34: FADE IN on MEDIUM SHOT of Father sitting in large comfortable chair on porch. From the careful way he eased himself into it, we know he has aches and pains and stiff muscles.

SCENE 35: CLOSE SHOT of Father. His feet are in a small tub of hot water. A cane is by his side. On the adjoining table are several bottles labeled "Liniment," "For Rheumatism," etc., a bottle of Aspirin, and a hot water bottle. He moves with great effort.

SCENE 36: MEDIUM SHOT on the porch as Junior comes skipping in, merrily. Bat in hand, he offers it to Father far more fine points in home-run hitting.

SCENE 37: CLOSE SHOT of Father showing intense distaste for the bat and all things pertaining to baseball. Painfully, he waves Junior away, very disgustingly.

SCENE 38: CLOSE-UP of Father in his chair. He picks up a book and starts to read. We can see the title. It reads, "Life Begins at Forty." FADE OUT.

All of these shots are easy to lens. Get a good variety in your set-ups and angles. If your camera will take "slow motion," shift to top speed for an interesting shot to cut in. Take position just behind the batter and below the level of his bat, shooting slightly upward. Have one of the boys toss a ball in, and let the batter swing at it. In slow motion the ball will appear to hang suspended in the air, seemingly impossible for the batter to avoid hitting.

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European Method of Reversing Cine Film

Continued from page 260

moving the frame in all directions. With this method of development the frame, however, should not be removed too frequently from the developing solution.

3. The reversed film shows clear transversal markings and dark marks along the length of the film or obliquely across it: This defect is due to unevenness of the illumination by white light. Care should be taken that the white light falling on the film should be of the same intensity over the whole surface of the film. If, for example, the film is exposed to white light both on the emulsion side and on the back (non-emulsion), it darkens much more rapidly than if it were exposed to white light only on the emulsion side. Hence, when developing on a frame, and in the absence of special precautions for protecting the back of the film from action of white light, the reversed film will show clear marks in those parts where the back of the film was in contact with the frame, whilst in those parts where the film was freely exposed (on both sides) on the frame, there will occur dark markings running lengthwise and obliquely on the film. These are due to the white light which has passed between the bands of film placed on one side of the frame and has affected the non-emulsion side of the bands of film situated on the other side of the frame.

Annual Movie Show

Continued from page 258

of about 60 deg. Fah. and consumed by the subject. The next step is to pack up the film in the container provided and to post it in the nearest letter-box to the proper address. This solution is so efficient that many of the best amateur cine films have been produced with its help and by means of the posting process I have suggested.

All credit to Duncan MacD. Little for his elevation of the amateur film to the full estate of entertainment institution! May there be many more Annual Movie Parties—and may the splendid conception be adopted in many other communities.

Wheels of Industry

Continued from page 264

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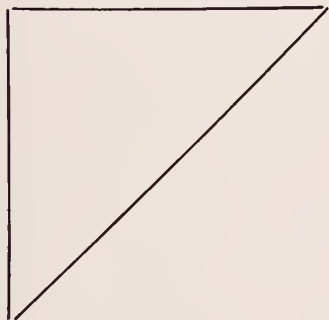
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The recognition of those who are given awards will be in the nature of a gold medallion which will be given by the American Society of Cinematographers who will be the judges of these pictures.

The pictures will be given classifications so that the competition may be fair to all entrants. By this we mean that an entrant having a documentary film will not compete with one who has based his on a scenario. Of course, there will be more classifications than these. The classifications will be created according to the pictures that are received.

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this issue

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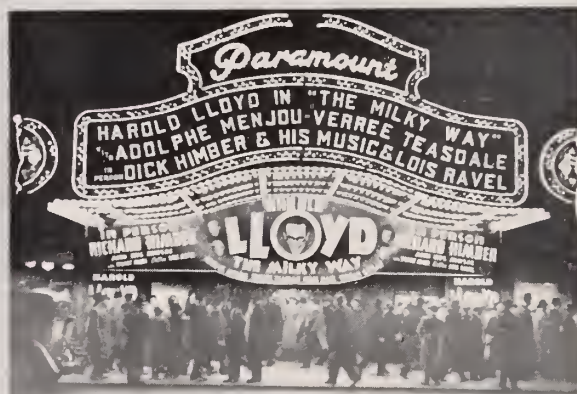
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What to Read

THE CHARACTERISTICS of Eastman Motion Picture Negative Films By Emery Huse, A.S.C.....	190
JOHN ARNOLD Chosen President Sixth Consecutive Year.....	193
DESCRIBING Agfa's Infra Red Film By Dr. Herbert Meyer, A.S.C.....	194
AUTOMATIC Control for Starting Camera and Sound By Wm. Stull, A.S.C.....	196
PROBLEMS of Controlling Correct Photographic Reproduction By Dr. Herbert Meyer, A.S.C.....	197
PROBLEMS in Lenses European Scenes By Harry Perry, A.S.C.....	198

Next Month

- Color pictures have presented new problems to the various technicians in the motion picture industry . . . one is make-up. Next month Max Factor, the best known manufacturer of theatrical make-up, will tell how his organization has met this problem.
- The generating of electricity on location is one of the essentials of good movie making . . . there are items that affect the camera . . . their improvement means more efficiency . . . we'll tell you about them next month.

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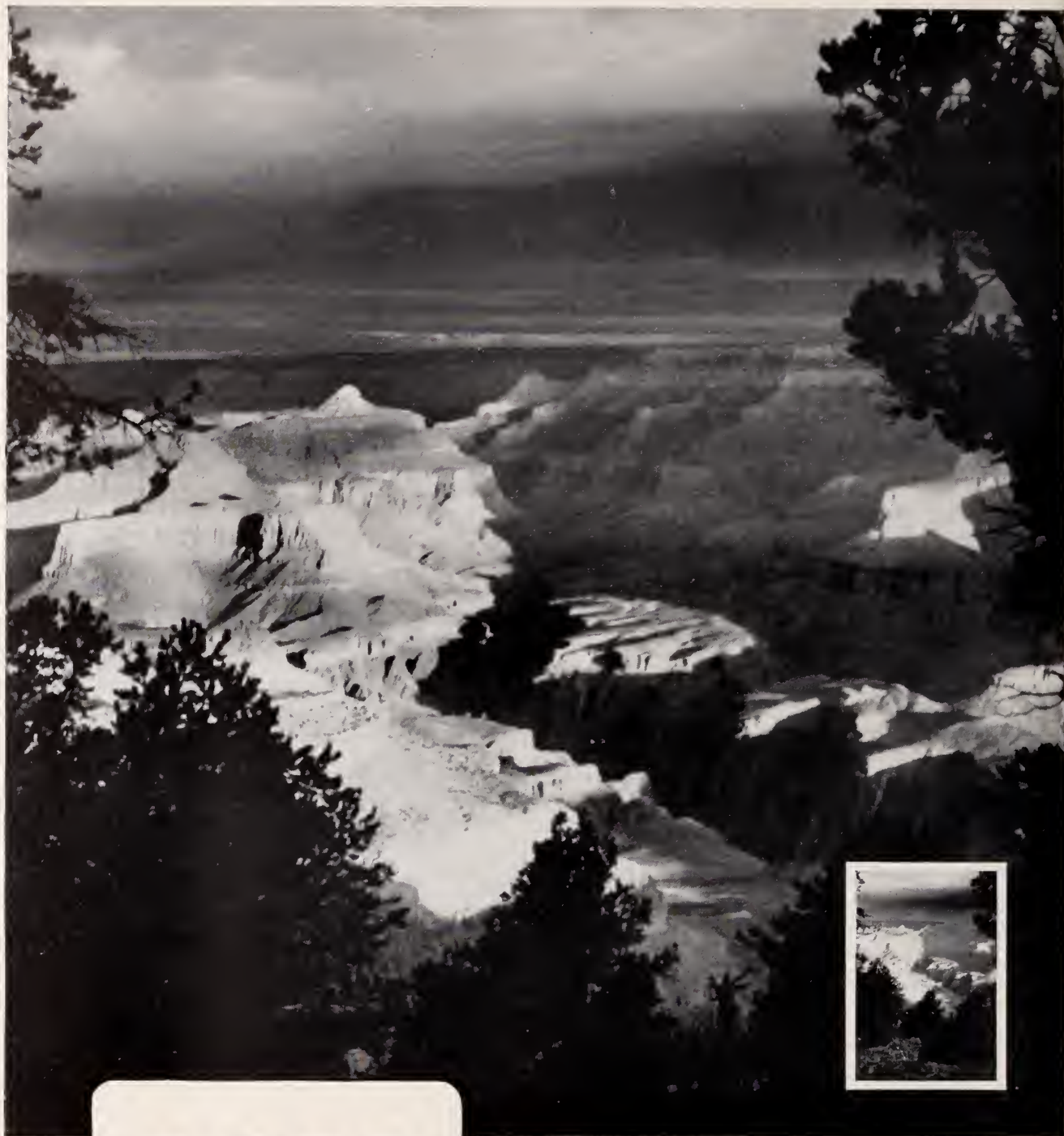
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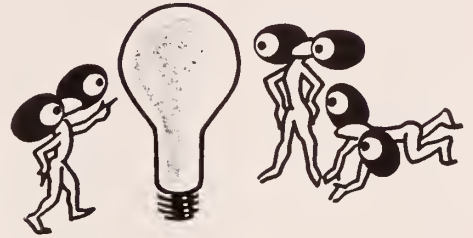
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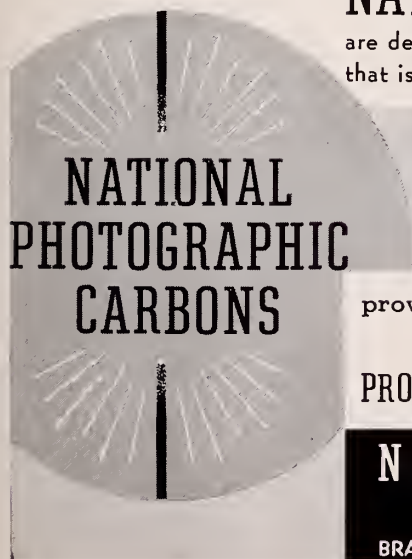
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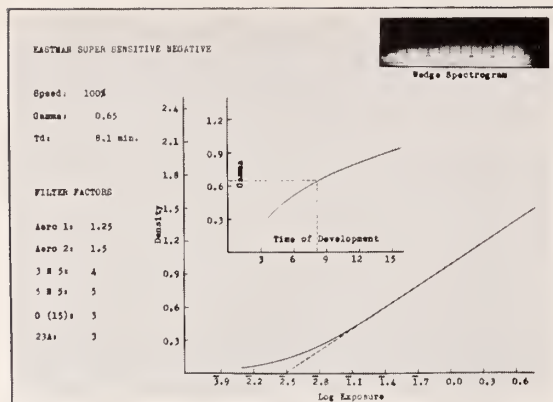


Fig. 1

IT IS GENERALLY ACCEPTED that photography is the foundation upon which the motion picture industry is built and it is not amiss to state that the negative emulsion is the foundation of photography. Primarily it is because of the importance of and the improvements in negative emulsions that photography has advanced to its present state. A decade ago camera and laboratory men were very little concerned with the color sensitivity properties of negative motion picture film, and panchromatic emulsions, while known, were rarely used.

In those earlier days orthochromatic negative film was generally used as the medium on which exposures were made. In conjunction with this film use was made of mercury vapor and arc lamps, since these light sources were considered the epitome in the field of studio illuminants. The orthochromatic negative emulsion, because of its blue sensitivity, was ideally suited for photography by the radiations emitted from the mercury vapor lamps, since the radiations from this lamp were very pronounced in the same spectral region. The carbon arc also emitted strong blue-green radiation and it was not uncommon practice to make use of both types of lamps in the illumination of a motion picture set. Since the orthochromatic emulsion was deficient in red sensitivity it mattered not at all that these light sources were deficient in this same spectral region. For exterior photography the orthochromatic film proved very satisfactory since daylight and sunlight likewise emitted considerable blue-green radiation.

It would be well at this point to digress and define more adequately the terms orthochromatic and panchromatic. A gelatino-silver bromide emulsion is normally only blue sensitive and unless the use of sensitizing dyes are resorted to, colors other than blue are inadequately reproduced. With the aid of dye sensitizing, emulsions may be rendered sensitive to other portions of the visible spectrum in addition to the normal blue sensitivity of the simple silver bromide emulsion. This silver-bromide emulsion having only blue sensitivity is referred to in photographic terminology as an "ordinary" emulsion. Using this type of emulsion as a basis for dye sensitivity research it was found that certain dyes rendered an emulsion sensitive to the blue-green, green, and yellow portions of the visible spectrum. Emulsions so treated by dyes as to produce this type of sensitivity are known as "orthochromatic" emulsions. The word orthochromatic implies that objects of different color brightness can be rendered in a truer gray scale than with ordinary emulsions. Further research in the field of dye sensitizing led to the discovery of certain dyes which have the ability to render an emulsion sensitive to the red region of the visible spectrum, this red sensitivity being acquired in addition to the blue, green, and yellow sensitivity of the orthochromatic type. Emulsions containing this additional red sensitivity are referred to as "panchromatic" emulsions, the word pon-

The Characteristics

chromatic implying that the emulsion has the ability to record colored objects in terms of grays in their proper brightness relationship. The Eastman Kodak Company first undertook the manufacture of panchromatic emulsion in 1912. These earlier emulsions for the most part were coated on glass plates.

As late as 1927 the majority of motion picture productions were made using orthochromatic negative with mercury vapor and arc lamps but from that date forward there was a steady trend toward the exclusive use of panchromatic films and light sources of the incandescent tungsten lamp type as well as high efficiency carbon arcs. The old type orthochromatic negative emulsion when used with incandescent tungsten lamps, exhibited far less sensitivity than when used with the mercury vapor arc lamps or daylight. It was natural, therefore, that a means be found to make use of this more efficient type of illumination. Since the field of emulsion sensitizing had progressed to the point where very acceptable panchromatic film emulsions could be manufactured, it was likewise quite natural that use was made of such emulsions. As was indicated above, the manufacture of panchromatic emulsions in this country began in 1912 but very little panchromatic film had found its way into the motion picture industry prior to 1927. It is difficult to state whether panchromatic film or tungsten lighting equipment first attracted the attention of the photographic world, since for years experimental research had been carried on in both fields, but it is interesting to note that both of them were brought forcibly to the attention of the motion picture industry during the latter part of 1927 and the early part of 1928. The real reason for this was due to the fact that the years of research in the two fields had reached a practical culmination at approximately the same time and since each was partially dependent upon the other, it is not difficult to understand their almost simultaneous introduction to motion picture photography.

It is impossible to discuss motion picture negative emulsions as they are now known without digressing for a moment for a discussion of another development in the field of photography which took place almost immediately after the introduction of panchromatic film and incandescent tungsten illuminants. Reference is made to the fine grain negative developer which was introduced to the trade by the Eastman Kodak Company in 1929. The reason that this discussion cannot progress without considering the developer situation is because of the fact that this developer single handedly played a very large part in the advancement of motion picture photographic quality.

In photography that chemical solution which is used to reduce the exposed silver bromide grains to metallic silver and thus make visible the effect of exposure is referred to as the developer. A developer consists primarily of a reducing agent, an accelerator in the form of an alkali, and a preservative, usually sodium sulfite. This does not imply that a developing solution contains only three chemicals since there are quite a few other chemicals which may be properly compounded to produce a developer which will give the desired degree of chemical reduction of the exposed film. In the days of orthochromatic negative a de-

of Eastman Motion Picture Negative Films

by

Emery Huse, A.S.C.Eastman Kodak Company,
Hollywood, California

veloper of a type which we would now consider extremely violent in its action was used. This developer and modifications of it consisted of the use of organic reducing agents, sodium carbonate as the alkali for accelerating the action of the reducing agents and sodium sulfite in just such quantities to preserve the developer against undue aerial oxidation. It was necessary that an active developer be used because of the limitations in the speed of the orthochromatic film and in the efficiency of the light sources. When, however, panchromatic film and incandescent illuminants were both available there were certain photographic quality deficiencies prevalent which it was felt could be eliminated by a different method of compounding the developer solution. Considerable experimental work had been carried on in the Research Laboratories of the Eastman Kodak Company and in 1929 a formula for the development of negative film, known as the borax developer, was offered to the trade. This developer differed materially from other types of negative developers in that its action was much less violent. Since it was known that sodium sulfite in excess acted as a partial solvent of silver halides, this fact was made use of. The borax developer consisted essentially of the reducing agents, the alkali and sodium sulfite in excess. Since a strong alkali causes a more rapid development and a greater tendency toward grain clumping during development, it was conceived that a weaker alkali would be an admirable partner for the silver halide solvent, sodium sulfite. This weaker alkali in the developer necessitated a longer time of development than had been customary with the old type of developers and this increased time factor gave the sulfite a better chance to get in its work. The combination of these two elements, namely, sodium tetraborate, (borax) and an excess of sodium sulfite, produced the real working factors of this new developer.

Since the panchromatic emulsions exhibited a fair speed characteristic the use of the borax developer did not cause any material disadvantages from the speed standpoint but the advantage derived was in the form of finer grain characteristics, which more than offset what at first seemed to be slight disadvantages. Because of the solvent action of sodium sulfite the borax developer produced somewhat less emulsion speed than the previous types. The very fact that this new developer came into use almost coincidentally with the introduction of panchromatic films and incandescent light sources made the problem of finally establishing a simple routine of practice somewhat more difficult. Not only were the cameramen involved from the standpoint of new lights and new methods of lighting, but the labor-

atory men also were confronted with the necessity of understanding fully the functions of the borax negative developer. The fact that panchromatic film, being sensitive to the entire visible spectrum, allowed for very little dark-room illumination further complicated this entire problem. In the light of our present day knowledge these factors are not considered difficult to handle but at the time of their introduction there were a considerable number of obstacles which seemed difficult to overcome.

During the first year after the introduction of these three new features, considerable progress was made. In a large measure the success of the application of these various technological aspects would not have been so satisfactory had it not been for the personal artistry of the cinematographer and the splendid cooperation of the laboratory technicians. To the men of both of these important branches in the motion picture field great tribute should be paid because they both gave considerable impetus to the production of high grade photographic quality to which we are accustomed today.

It was found that as time progressed the first type of panchromatic emulsion used for motion picture photography was not all that could be desired. While there was progress shown it was felt by the emulsion manufacturers that definite improvements could be made in the negative emulsion itself.

The first outstanding improvement in negative emulsions was made during the latter part of 1928, at which time the Eastman Kodak Company introduced Eastman Type II panchromatic motion picture negative film. This film when compared directly with its predecessor showed a marked improvement and was the first real step in the direction of finer photographic quality. As time passed and the use of the new illuminants and the new developer were better understood, it was found that this Type II negative also lacked certain qualities which it was felt could be overcome in a new type of film. In February of 1931 Eastman Super-Sensitive motion picture negative film was presented to the trade. This negative introduced a new era in the negative emulsion field. Not only was the quality of this film superior to that of Type II but its speed was materially greater. Under daylight conditions it exhibited twice the speed of Type II, while with normal set lighting it was nearly three times as fast. There was less contrast shown by this emulsion and a much finer graininess characteristic was in evidence. This film played a very important part in the fine photographic quality exhibited in motion picture production during the years 1931 to 1935. During these latter years steady advancement was made in the field of illuminants, during which time more efficient light sources of the tungsten type were manufactured. The functions of the borax developer were more thoroughly understood. Likewise by 1931 the use of developing machines for the development of negative film,

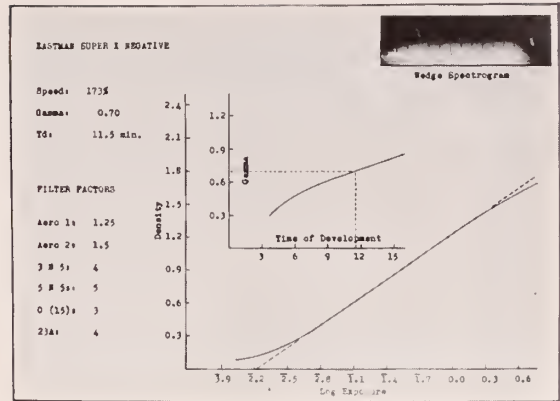


Fig. 2

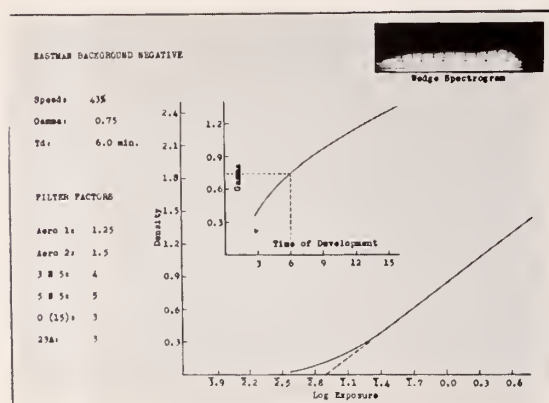


Fig. 3

as well as positive film, had almost completely supplanted rack and tank development in the major motion picture laboratories. Machine development in itself played a large part toward contributing to better photographic results.

Following the general policy of the Eastman Kodak Company to strive continually in the improvement of its products, there was manufactured during the year 1935 a new type of panchromatic negative film which was given the name Eastman Super X. This emulsion exhibited certain superior qualities to those of the Super-Sensitive film in that a speed increase of approximately 75% was shown, together with a slightly softer characteristic and a definitely finer grain structure. This emulsion met with immediate approval after complete tests by the camera and laboratory men and at the time of this writing approximately 95% of the motion picture productions made on film of Eastman manufacture are photographed with this new Super X Panchromatic Negative.

The emulsions which have just been described are in a sense in a direct line of succession since each new one replaced the older one completely for the purpose of normal motion picture work. However, there were other fields of endeavor open to the emulsion manufacturer. During the years 1931 to 1934, particularly, considerable experimental work, as well as production work, was being done in a new field known as the Projection Background Process. This process more or less completely superseded other special effect processes which had been in use for several years. The fundamentals of the projection background process are extremely well known but some details of it have escaped general attention. Since the process of rephotographing a projected image on a translucent screen is essentially one of duplication it may be readily observed that any step toward the elimination of the emulsion graininess characteristics would be desirable. It was conceived that a negative emulsion with sufficient speed for exterior photography, since most soft background plates were exteriors, would lend to a greater improvement of the final results of this special process. An emulsion for this purpose should have similar color sensitivity characteristics to that of the negative but it should be dissimilar in that its grain structure should be materially finer. An emulsion for this purpose was manufactured and marketed under the name of Eastman Background Negative. This was introduced to the trade in the year 1933. Compared with Super X Negative this emulsion has about one-quarter the speed and exhibits definitely higher contrast under equal development conditions. The graininess factor, however, was excellent and without question this film soon established itself as the finest grained panchromatic negative emulsion in general use in the motion picture field. It is today almost exclusively used for the production of projection background plates but other uses are being found for

this film because of its very fine grained characteristic. In all the foregoing paragraphs there has been presented a miniature chronological history of the factors which have lent themselves to the achievements in photographic work which are possible today in the motion picture field. While it is the purpose of this paper to discuss particularly the current Eastman motion picture negative emulsions, such a discussion could not be given satisfactorily without devoting considerable time to a discussion of accompanying developments along other lines. Since it is felt that the historical side of this problem has been established, it is now possible to proceed with a discussion of the photographic emulsions themselves and the differences which exist between them.

The original panchromatic motion picture negative film as introduced in 1927 and the later Type II film, although of more recent origin, are more completely removed from the motion picture field of photography than the old type orthochromatic negative, since this latter film is still manufactured for certain laboratory purposes. It is interesting to note that for such purposes this film is rapidly becoming obsolete. The three Eastman motion picture negative films now available are Super-Sensitive, Super X, and Background. A detailed graphical and quantitative comparison of the characteristics of these three emulsions may be had at a glance by a comparison of Figures 1, 2, and 3. It will be observed that the color sensitivity difference between these emulsions is slight. The Super-Sensitive and Background negatives are essentially the same in this respect. The Super X Negative differs slightly in that its red sensitivity is somewhat reduced. This fact can be readily determined by a comparison of the filter factors of the 23A (red) filter. The filter factor of this filter for Super X Negative is 4, while for the other two films it is 3. Since the filter factor is a multiplying factor for exposure, the larger that factor the lower the sensitivity. The data on these three emulsions were obtained under identical conditions of testing. Exposures and subsequent development were simultaneously made. These emulsions may be classified in the order Super X, Super-Sensitive, and Background Negative in terms of descending speed, while from a contrast standpoint the emulsions would range in the same order for ascending contrast characteristics. It will be seen, furthermore, that the characteristics of these three emulsions are tabulated for different values of gamma. This point needs some explanation. When Super-Sensitive Negative was in general use the average degree of development given it in the motion picture laboratories was represented by a gamma of approximately 0.65. Gamma is that characteristic of the film which indicates the degree of development. With the introduction of Super-X Negative and its generally lower contrast characteristic it was found desirable to raise the average gamma to 0.70, it being determined by practical test that the emulsion quality of this negative was greatly enhanced at this slightly higher value. This change in average gamma from 0.65 to 0.70 represents an increase of only approximately 8%. Since the Background Negative is inherently one of high contrast and since one of the purposes of the Background Negative is to produce a somewhat more contrasty result, it was found that an average gamma of 0.75 was desirable for this material. It should be well understood that these values of gamma are approximations since they represent the average extent of development of these films in practice. Departures plus or minus from these average values are naturally at the discretion of the individual user. The times of development to produce these average gamma values for each type of negative progress from the Background Negative, for which a short time of development

Continued on page 202

John Arnold Chosen President Sixth Consecutive Year

BY UNANIMOUS VOTE of confidence the American Society of Cinematographers in its annual election returned John Arnold to the high office of President for his sixth consecutive occupancy of this responsible post. His retention is fluent testimonial to the courageous and sound leadership, the untiring effort and the far-sighted diplomacy with which he has guided Society affairs through the troubled waters of the past half-decade.

So thoroughly, indeed, did personnel of the Society place its mark of approval on his administration that the entire group of officers and board of governors was re-elected to assure continued application of his policies.

Victor Milner was re-appointed First Vice-President, Charles Lang became Second Vice-President, James Van Trees, Third Vice-President. Fiscal accounts remain with Fred Jackman as Treasurer. Frank B. Good carries on as Secretary. Van Trees and Jackman are former Presidents of the Society.

John Arnold has captained the Society well during these five years. Unprecedented problems concerning the individual cinematographer and the profession as an entity have arisen and have been dealt with adroitly. The relationship of cinematographer and producer is of record through parleys and concurrences openly arrived at. As a result, the photographer enters upon the practice of his profession unharassed by commercial uncertainties. Minor misunderstandings, as must come to all contracting parties, have quickly and equitably been adjusted through the Society's good offices. The Society has become more adult in its outlook upon its own cinematographic craft and upon its integral relationship to the motion picture enterprise.

Its imposition of high professional ethics has reflected prestige to the individual, the art and to the Society. It has acquired important recognition in the community, in the film industry and in cinema circles throughout the world. It has maintained increasing standards of technical, artistic and box-office production.

Touching upon his acceptance of a sixth term, which extended service is without parallel in Society annals, Arnold stated, "It is a fine compliment and a very appreciated honor from my fellow cinematographers. But I would slight this opportunity, if I failed to italicize that charting the Society's annual course has been the deed of no single individual. Fifteen representative members have cooperated at the helm. Your Board of Governors have given unsparingly of their time and experience, not always a simple matter under pressure of studio assignments. To them a full measure of tribute is due. Likewise, to the many members who have so freely contributed vital knowledge to the successful solution of technical, social and ethical problems.



John
Arnold
A.S.C.

"The Society during the year just closed found itself faced, as it does every year, with involved situations arising out of the constantly developing state of our industry. Calm, honest and tactful consideration of all interests resulted in still further security and solidity of our professional position.

"I am happy to see the Society assuming the proportions of an honorary professional guild, discarding any semblance to a mere trade group. Such an association of directly-concerned artisans having a unity of purpose can be expected to contribute importantly to the advancement of the common art. I believe the Society will make valuable strides in this direction during the coming year.

"More matters of academic concern will more thoroughly be scrutinized. We hope the Society, with its abundance of practiced technical and professional knowledge, may extend its inquiries deeper into realms of research. New mechanical devices, new methods, new optical applications may well be given exhaustive laboratory and field testing, with results accurately established for benefit of individual members, production heads of studios and the industry as a whole. Surely no group of men is in position better to render these authoritative data.

"Various processes of color photography are forging their way to public acceptance. There is much the Society can contribute to the advanced application of this medium to motion picture entertainment. It is a topic of immediate interest to each member.

"Negotiation of prime working conditions can well be entrusted to those who have painted these factors to their current amicable status.

"Happily, the Society is in sound shape financially. No administration officer derives remuneration for his services. We have no internal manoueuering for personal gain. Cultural and social activities are developing. Public and professional recognition of our work is growing. A spirit of harmony and fair-play exists, with the desire of a square deal for the other fellow. We have neither chiseling competition nor restricting regimentation.

"Inclement weather lies behind us. Encouragingly bright days loom ahead for the cinematographer and for his Society."



Figure 1: Spectrogram of Infra Red film.

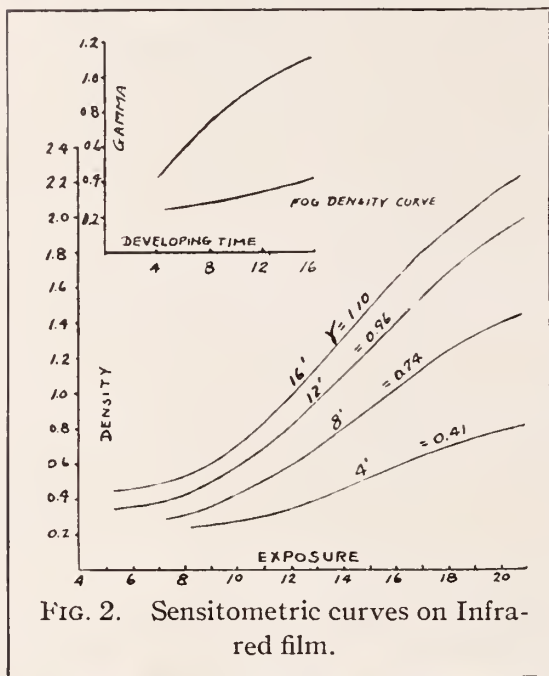
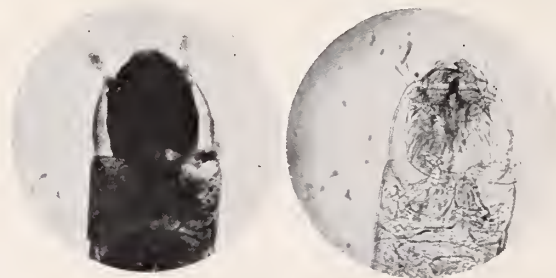


FIG. 2. Sensitometric curves on Infra-red film.



Bottom illustration: Microphotogram of head of worm. At left on Orthochromatic film; at right on Infra Red film.

EDITOR'S NOTE: This is the second of the series of articles offered by this magazine describing outstanding achievements of the past year recognized by the Academy of Motion Picture Arts and Sciences in their recent awards. Sometime ago a detailed description was published of the Pola Screen.

THE BEGINNING of Infra Red photography dates back to 1905 with the discovery of the first sensitizers, Dicyanine and Dicyanine A, which extended the sensitivity of silver bromide emulsions past the red end of the visible spectrum. Today there are available emulsions in which the sensitizing maximum is located as far as 1050 m μ , and thus permitting the photographing of radiations up to even 1360 m μ .

Emulsions of this characteristic naturally aroused interest due to the possibilities they promise to offer in different fields of science.

Spectroanalysis of chemical elements and compounds succeeded in gaining additional valuable data and knowledge in regard to molecular structure by the use of Infra Red spectrophotography.

Describing

In the field of astrophysics, the availability of Infra Red plates enlightened explorers in many ways as to the atmospheric conditions surrounding stars and planets. From the photographs of the spectrum of Jupiter and Uranus, for instance, Infra Red absorption bands could be identified with those of ammonia and methane.

In the field of botanical research, the particular reaction of Infra Red sensitive photographic material towards reflected selective radiation has been utilized to create new methods of recognizing the beginning and progress of abnormal conditions in leaves as caused by certain types of fungi. In the medical field, and in that of microscopic research, (see illustrations), the same characteristics of Infra Red emulsions have been found to be of great value in the study of many different subjects.

Infra Red emulsions are equally interesting and useful in certain phases pertaining to pictorial photography as discussed in the following:

1. Long Distance Photography and Penetration of Aerial Haze by means of Infra Red Emulsions.

Light reflected from objects is partly scattered and diffused by the atmosphere lying between the object itself and the camera. In addition, the atmosphere, itself, sends out scattered light which is commonly observed in the form of the blue appearance of distant objects. Due to the first-named condition only part of the reflected radiation reaches the photographic material which causes a reduction of the original contrast in the reproduction. The scattered light sent out by the atmosphere records itself in the photographic reproduction in the form of a general fog over the entire picture, and thus further reduces the contrast.

Both conditions are increasingly noticeable for radiation of shorter wave length (blue) as long wave length radiation, (red and Infra Red) is far less scattered by the atmosphere.

This is the reason why Infra Red sensitive emulsions used with a lighter filter to absorb blue radiation will render long distance photographs especially clear and permit penetration of aerial haze to an amazing extent as illustrated by the accompanying pictures.

2. Photography of Night Effects in Daytime.

Blue sky does not reflect any Infra Red radiation. Therefore, if such a sky is photographed on an Infra Red sensitive emulsion by using a red filter, absorbing all blue radiation, the sky will be rendered completely black in the photographic reproduction.

Green foliage will, however, record very light for the reason that the chlorophyll present in all leaves and responsible for their green color, reflects Infra Red radiation to a large extent. The combination of these two reactions typical of Infra Red sensitive emulsions results in the fact that photographic reproductions of landscapes made in the daytime on film of this type create a strikingly similar impression to that of scenes observed in full moonlight.

It might be of interest to mention here also that Infra Red film, when used to photograph heavy cloud effects, will give many unusual and excellent results, which is a particularly valuable asset in aerial photography.

Afga's Infra Red Film

by
Dr. Herbert Meyer, A.S.C.
Agfa Ansco Corporation

The Agfa Ansco Corporation of Binghamton, New York, has perfected an Infra Red sensitive emulsion, available also in 35mm width, which has been used successfully in productions of Hollywood major studios during the past year. The importance and quality of this film type has recently been exemplified by the fact that one of the two highest technical awards from the Academy of Motion Picture Arts and Sciences for 1936 has been given to the Agfa Ansco Corporation in recognition of the merit of this product. Below is a short description of the characteristics of this film type as taken from an earlier paper delivered at last year's spring convention of the Society of Motion Picture Engineers.*

The general speed of Agfa Infra Red is approximately one-half that of Superpan, that is, when both types are exposed without filters and developed to the same gamma.

This film type is not sensitive to green-yellow, which permits the use of relatively light red filters as it is only necessary that these filters absorb blue. The filter factor for Infra Red in combination with Wratten filters of the series 21 and following up to 29 F as found by practical tests and sensitometric comparison is of the order of 10 to 15. At standard motion picture camera speed, a normal exposure in full sunlight and blue sky on Infra Red using Wratten filter No. 25 will be obtained with a lens opening of 5.6. The use of deeper red filters is not recommended except for special scientific work as they unnecessarily prolong the exposure due to their lower transmission factor without rendering better pictorial quality.

Fig. 1 is a spectrogram of Infra Red film, indicating the color sensitivity over the range of the visible spectrum.

Fig. 2 shows graphs of sensitometric curves exposed on Infra Red film in an Eastman time-scale sensitometer, and developed for different times in a regular motion picture borax developer.

The gamma-time curve and the fog-density-time curve are also inserted in these graphs.

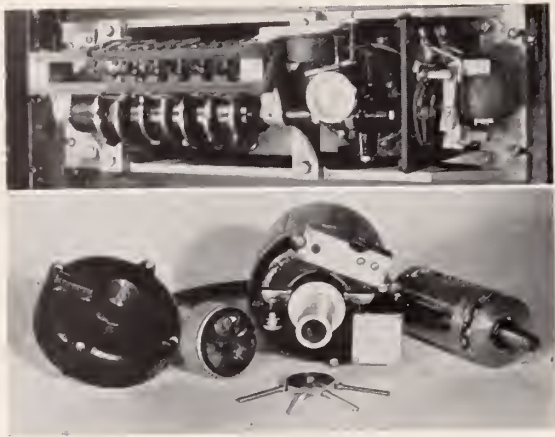
In comparing these sensitometric curves with those of

Continued on page 201



Top illustration: Supersensitive Panchromatic film with Wratten Filter No. 29F.
Second illustration: Agfa Infra Red Film with Wratten Filter No. 29F.
Third illustration: Orthochromatic plate with Agfa yellow filter No. 3.
Bottom illustration: Infra Red plate with Agfa Infra Red filter No. 85.

*Journal of Society of Motion Pict. Eng., Vol. 25, No. 3, 1935, Page 249.



Top: Sequence switch which operates the automatic starting system. Bottom: 48 cycle camera motor disassembled.

Automatic Control for Starting Camera and Sound

by
William Stull, A.S.C.

EVER SINCE the intricate mechanism of talking picture production displaced silent film-making, a need has been felt for a method whereby the sequence of operations at the start of a sound "take" could be simplified and expedited. Under average operating conditions, one or more cameras and recording-machines must be started, synchronized, and brought to operating speed, scene and "take" numbers slated for sound and picture, synchronizing marks imprinted on both picture and sound negatives, while such auxiliary related operations as the stopping of ventilating fans, turning on of door signals, and so on must also be performed. As a rule, this inevitable chain of operations can rarely be performed in less than half a minute; if the company personnel is not perfectly coordinated, an even longer time lapse may occur.

The monetary value of the time thus lost can be considerable, especially when compounded to include the operations of a large studio for any length of time. The material wastage—especially film—will also reach a good-sized aggregate. Even more important, though less tangible, is the psychological effect of the delay, and its attendant confusion, upon the creative personnel of the company, whose work frequently depends upon maintaining a difficult emotional pitch from rehearsal to "take."

The Metro-Goldwyn-Mayer studio developed, and for some time has been using an automatic starting-control system which reduces these factors to the minimum. A

single control serves to start and stop the entire system: the time-lapse interval has been reduced to four and one-half seconds.

Essentially, the device consists of a sequence switch, controlled by a single push-button switch on the set. In starting the system, throwing the master switch on the set starts the sequence switch, which is located in the sound building. This, in turn, starts the camera motors and recording motors, and operates relays which turn off stage ventilators, and turn on the warning signals outside the sound stage. As soon as the camera and recording motors are up to speed, the sequence switch operates a shutter on the recorder, permitting the recording light to reach the film. This shutter in opening closes contacts which operate a small fogging light in the camera; these automatically provide synchronizing marks on both sound-track and picture film. At the conclusion of this chain of events, a single-stroke bell is sounded on the set, informing the personnel that the system is operating.

In stopping the system at the end of the "take," operation of the control button again operates the sequence switch, which reverses the starting operations, making synchronizing marks, closing the recorder shutter, stopping camera and recording motors, starting the ventilators and releasing the door signals. This requires but one and one-half seconds.

If for any reason the control button is operated back and forth rapidly, the automatic system merely follows through the last instruction given it—that is, obeying the last position of the control button. Both camera and recorder can be operated off the system when necessary for slating, silent "takes," individual sound tracks, etc.

An important change brought about coincident with the adoption of this system is the use of 48-cycle rpm. synchronous motors for driving the cameras. It will be recalled that in many installations, the camera motors run from 50 or 60 cycle power, and operate at a considerably higher speed, which necessitates the use of reduction gearing. The first camera motors used at the M-G-M studio, for example, ran at 3,600 rpm. from a 60-cycle supply. By using 48-cycle, 1440 rpm. motors, it is possible to eliminate the gearing, and connect the motor directly to the camera's shutter-shaft. This has done a great deal toward reducing camera noise, for it was found that a very large part of this noise came from the motor gears.

The studio's recorders were designed to run at 1,200 rpm., which necessitates a 60-cycle supply, while the power circuit supplying the studio is 50 cycles. Therefore a 50-60 cycle 60 KVA motor-generator set produces the 60-cycle three-phase circuit necessary for the recorder drive, while a 20 KVA 50-48 cycle frequency changer provides the three-phase 48-cycle current for the cameras. Since both of these units are powered from the same 50-cycle source, they and the equipment they power operate synchronously.

The camera motor gets up to speed in about two seconds, while due to the different nature of the recorder's mechanism, this unit requires about four seconds to start and settle down to a uniform recording speed. As these times naturally vary according to the load and other variable conditions, it is necessary to have some means of keying the sound and picture films together. This is done by means of the synchronizing marks made by the recorder-shutter and fogging ('bloop') light.

The shutter on the recorder is placed between the light-valve and the objective lens, and shuts off all light from the film. It is controlled electromagnetically, and opens or closes in about 1/250 second, thus giving a very sharp transition from an unexposed to a normally exposed track. As the contacts operating the camera fogging-light are me-

Continued on page 200

Problems of Controlling Correct

Photographic Reproduction

PART 6

by

Dr. Herbert Meyer, A.S.C.

Head of Hollywood Research Bureau,
Agfo, Ansco Corporation

THERE STILL REMAIN additional phases of photographic reproduction to be dealt with such as duplicating, lap dissolves, multiple exposures, background photography, and many similar interesting fields, which will only be mentioned here.

The cameraman whose name appears in the credit list as being responsible for the photographic quality of the picture should always be concerned about the excellence of these special procedures for if they interrupt the smooth continuity of otherwise fine material, they might create a bad impression on the public mind, and thus reflect unfavorably upon his reputation. The same is true of excellent "dailies" which eventually suffer poor quality release printing, ruining the best pictorial efforts of those responsible.

All processes, such as dissolves, background projection photography, and general duplicating, involve producing a duplicate negative of either a part of or the original negative in its entirety. The two major problems to be solved in connection with this procedure concern that of graininess and resolving power. It is well known that any weakness in this respect, inherent to the original negative, will be greatly magnified in the duplicate negative. In addition to this, the matching of contrast and the preservation of the correct density level also demand particular attention.

The methods of making duplicate negatives vary greatly in Hollywood laboratories, although a standard method which would produce the best quality should be appreciated by everyone concerned. Few laboratories apply sensitometric control in the processing of duplicate negatives.

At present almost any type of low contrast emulsion can be found serving as material for duplicate negatives. They range from the fastest panchromatic and orthochromatic types to slow special dupe negative emulsions of positive speed, depending mainly upon the different theories adopted by the technician in charge as to the proper method to produce the best results.

All duplicate negatives are obtained by printing from a master print. The contrast and density level of the developed duplicate negative logically depends upon the contrast and density level of the master print, which as a rule is similar in density range and contrast to that of a regular black and white positive print, and correspondingly the dupe negative is developed approximately to the same gamma as the original negative to yield the proper overall contrast.

Consideration has also been given to another method which consists of developing the master print to a relatively low gamma in negative developer, and, therefore, requires a higher gamma value for the processing of the dupe negative. This provides an extended printing latitude in the master print, and also permits the use of relatively fast negative emulsions of high contrast, and, therefore, finer grain to produce the dupe negative.

A third possible method consists of making a direct duplicate from the original negative by using the reversible process. This method undoubtedly should render the best quality as far as grain and definition are concerned.

Unfortunately, the quality angle in making duplicates commercially, suffers greatly from practical and economical restrictions.

In concluding this article, we would like to point the

attention of the cameraman to an error quite frequently made by confusing the artistic and technical elements of his work. The cameraman should consider himself both an artist and a technician. As an artist his strength lies in his sense of intuition and his individuality. As a technician he should rely upon accurate knowledge of scientific facts and laws concerning or governing photographic processes. The latter has very little to do with art, which, however, is not commonly recognized.

Any technical instrument for instance, which is built and created to replace human judgment by automatic measuring devices, will be accepted by the cameraman, who is correctly technical-minded, as a true means of helping him to simplify his technical problems. In addition, he will recognize that the more such an instrument relieves him from concerning himself with cumbersome calculations, the more time he is able to apply to the study of his artistic problems.

The difference in rank should be solely judged from artistic ability. As far as solving of the technical problems is concerned, every cameraman is able to know and learn as much as his fellow worker, although it will be admitted that the success of practical application is always dependent upon personal talent and experience.

We still find, however, a large number among cameramen who show hesitation toward using automatic measuring devices, such as light meters or exposure meters, merely based upon the wrong conception that using automatic technical devices will unfavorably reflect upon their artistic reputation.

As previously stated, it is to be regretted that up to the present time the technic of correct photographic reproduction locks quite a number of mechanical devices, which would help to obviate human error, thus preventing costly mistakes and also aid in distinguishing real artistic workmanship from pure skillfulness.

We tried in these articles to analyze the problem rather than to state the solution, which at its best, and not belittling the high progressive standing of photographic science and technic of today, could never be called a complete solution.

We intended to show the cameraman and the laboratory technician their specific problems from each others' viewpoint, and how vitally the success of either's efforts depends upon correct understanding and treatment of the

Continued on page 204

Problems in Lensing European Projection Scenes

by
Harry Perry, A.S.C.



Harry Perry, A.S.C.

TRAVELING ABOUT EUROPE getting background projection shots is not without its moments for a Hollywood cinematographer. Almost anything may happen at the most unexpected time—and usually does. The American public is so picture-wise, and sympathetic cooperation in picture-taking is so easily obtained from all sources that the European obstacles which pop up without warning present trying situations, extra expense and serious production delays.

Not many weeks ago I arrived at the Italian border en route from Nice to Naples. With me was a camera car, camera equipment, an assistant and a driver. Advance arrangements had been made covering the entry of my party and the equipment through customs. I looked forward to getting my shots and being back to Paris within three or four days.

On that day the sanctions against Italy went into effect. Britain was being held responsible and I, of course, spoke English. Naples was the main port of embarkation of troops and war supplies to Ethiopia. My arrival with motion picture camera equipment, bound for Naples, was viewed with the greatest alarm by the border patrol and customs officials. They flatly refused entry for the camera. And there was nothing I could do about it.

I went on to Rome and besieged official bureaus for a temporary permit calling for immediate forwarding of the equipment. No one would accept the responsibility of permitting the camera to come in. They acted as though the request was a threat to Italy's very security. Day after day

was spent in this futile search for some way of getting my equipment where I could use it. Meantime, the studio wanted those scenes of Naples.

One can't be in Rome many hours without realizing that a man by the name of Mussolini apparently has considerable influence in government circles. As a last desperate chance, I decided to appeal to him. In blunt, typical Yankee manner, I sat down and sent him a telegram. And waited to see what would happen. Attaches at my hotel were greatly concerned. Sending telegrams to Il Duce was a thing not being done.

The message brought fast action. The following morning I was requested to appear before the Minister of Propaganda. Entering his office, with misgivings as to what might follow, I noticed my telegram with a translation on his desk. I explained my predicament and mission. To my vast relief, I found him a sympathetic official.

The next morning my equipment was in Naples. So was I. And with me were two policemen. They saw to it that I got the street scenes I needed. They also saw to it that I went nowhere near the military zone. Italy has a censorship requirement that all motion picture negative exposed in the country must be developed and examined before leaving. But these police officers vouched for the innocence of my film to the censors and permitted me to ship it to Hollywood without interference.

So far as I could learn, there is very little picture production in Italy at present. There is much talk of the "second Hollywood" Mussolini is said to be building outside Rome. It will be operated as a government enterprise, as are most of Italy's industries. When it will start operations, no one could say.

In Spain, film production is at a veritable standstill. There is very little activity in France, beyond a few small independent outfits. England is buzzing with studio enterprise. The studios appear to have plenty of money and are going ahead with ambitious production plans. They firmly believe they can show Hollywood real competition. Their technical equipment, experience and talent seems to lag considerably behind ours, but is steadily improving.

There are many Hollywood studio folk in London. Those with contracts calling for good salaries say they enjoy working in England. Those out of work, and there are quite a few, naturally aren't so enthusiastic. The last thing a Hollywood technician should do is to go to London looking for a connection. There are more men, and good men, than jobs.

Continued on page 203

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Automatic Control for Starting Camera and Sound

Continued from page 196

chanically attached to the shutter, the time relation between the sound-shutter and fogging-light is almost perfectly uniform, and synchronizing marks are provided at both ends of a "take."

The fogging-light is a small switch-board-type lamp, mounted so that it exposes an area corresponding to the sound track, and has no effect on the picture proper. A condenser is connected in the lamp circuit, so that the first application of current from the recorder shutter gives a voltage surge which momentarily over-volts the lamp for about 1/24 second, giving a synchronizing mark which corresponds to the sudden opening of the recorder shutter. Connected in series with the lamp is a small buzzer, which operates when the fogging action takes place. In the rare event that the lamp should be loosely connected or burned out, the buzzer does not operate, warning the Operative Cameraman of the lamp failure in ample time to provide an emergency hand-clap synchronizing-mark for the "take."

A switch is provided on the camera-bungalow, which permits the Cameraman to change control of the camera from the automatic system to himself or vice versa, at any time. Thus in the case of an extra camera, the Operative may cut into the automatic system in the middle of a "take" and not only be perfectly synchronized with the sound, but have the automatic synchronizing mark placed at the end of his "take" in the usual manner. The reverse is also true.

The control circuits are of low voltage (12-volt D.C.), and the connections between the stages and the sound building control apparatus are simple and inexpensive. One sequence switch is required for each recording machine. Twelve of them are in use at the M-G-M studio. These switches consist of a familiar series of cam switches mounted on a common shaft which is driven by a 110-volt D.C. motor fitted with a quick-acting brake to prevent over-running. The cam designs and timing are calculated to match the operating characteristics of the devices they control. While such a switch is complicated in design and installation, its simplicity minimizes operating trouble and maintenance problems.

The sequence switches and recording machines are permanently identified with each other. Patching any recorder to a given stage involves only a conventional patching operation on the central distributing board, and automatically carries all the necessary connections for the control system to the stage.

Certain minor modifications have been made in standard recording machines to adapt them to working with this starting system. In addition to the shutter

and its attached contacts already mentioned, it was necessary to place an electromagnetically operated clutch between the recording and the driving motor, to minimize the slow stopping which results from the flywheel action of the driving motor. The clutch engages upon the first application of power to the motor, and releases when the power is shut off. This makes it possible to stop the recorder in an interval equivalent to about six inches of film, while allowing the motor to drift to a stop.

As a matter of safety, a door switch is mounted in the recorder, so that the system, usually controlled from the stage, cannot start while the recorder door is open. A switch similar to the one mounted on the camera is also mounted at the recorder, and permits the recorder-operator to isolate his machine from the control system when necessary, or to control the entire system from his machine.

In connection with this system of controlled starting, an unique method of slating has been evolved. Slates are now photographed on only the first "take" of a scene. A lag is kept by the Assistant Cameraman, recording the footage and "take" numbers, and including tests, etc. This lag accompanies the film to the laboratory, where, in the title department, full-frame titles are made, corresponding to the slates required by the lag. These slate-titles form the leader between successive scenes in the rushes, and naturally give a more easily read scene indication in projection and cutting.

In recording, visible-numbered raw stock is used. The recorder notes the key number at the start of a magazine, and thereafter logs each successive "take" in terms of footage and key numbers.

When the two negatives reach the laboratory, they are developed in physically separated departments. Thanks to this method of scene identification, the sound and picture negatives need never be physically associated. A standard length of title-slate leader is inserted in the picture negative, and an exactly equal length of blank leader in the sound negative. When the two negatives are printed, they will automatically be in synchronism with each other.

This discussion of the automatic-control starting system has, it may be noticed, been predicated upon central recording-plant operation. It is, however, equally applicable to portable units. In the portable installations, however, practical considerations arising from the problems of location units have made it advisable to substitute a hand-operated device for the electrically-operated sequence switch. It is equally efficient, and operates almost as rapidly.

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This system has been in use at the Metra-Goldwyn-Mayer studio for some time, and this year received Honorable Mention in the Academy Technical Progress Award. It was conceived by Douglas Shearer, A.S.C., and was developed under his guidance by the engineers of the Metra-Goldwyn-Mayer studio's Sound Department.

Describing Afga's Infra Red Film

Continued from page 195

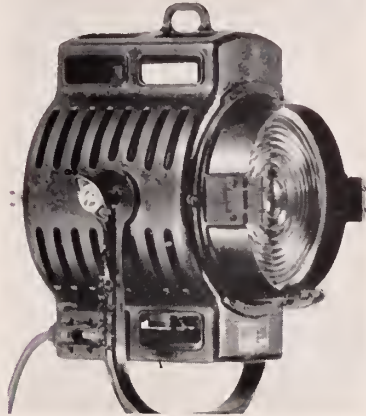
supersensitive panchromatic types, it will be noticed that the gradation of Infra Red film is considerably steeper. Exposure of Infra Red film through red filters naturally causes an increase in contrast which was found to be approximately 7 percent, referring to increase in gamma values.

The sensitometric curves shown in Fig. 2 were developed using a green safelight, Afga No. 103.

Green filters permit the transmission of Infra Red rays to same degree, and,

therefore, cause fog on Infra Red sensitive emulsions during an extended development. This is evidenced in the fog-density-time curve shown in Fig. 2, which marks the rapid increase in fog density with extended developing time. For normal developing time, however,

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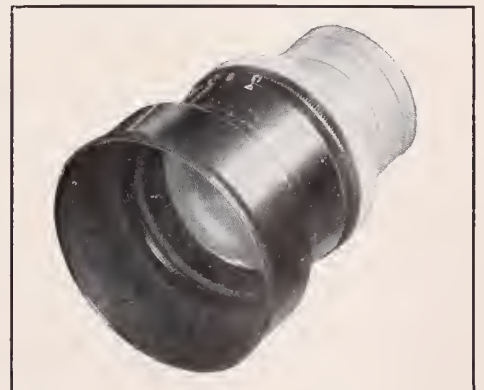
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it is permissible to use green lights with the ordinary precautions.

Agfa Infra Red film is regularly manufactured on a gray base for protection against halation.

Before this film type was available, all artificial night effects were made by using panchromatic films with heavy red filters. It is admitted that this combination will serve quite satisfactorily for this purpose in many cases, although it is not possible to reproduce on panchromatic film cold moonlight effects nearly so well as an Infra Red film. (See illustrations.)

Besides, the use of panchromatic film necessitates very deep red filters or filter combinations, the exposure factor of which is quite frequently impractical.

The technic of photographing night effects using Infra Red emulsions is not at all difficult to acquire. It should, however, be mentioned that full knowledge of the wide range of possible variations in contrast by use of different filters will greatly enlarge the usefulness of this product. In connection with this, attention is pointed to the fact that, for instance, moonlight effects are far more contrasty in the conception of the human observer than night shots,

wherein the illumination is served by artificial light sources, such as street lamps or lighted windows. This fact alone requires a film material which offers a greater latitude of contrast than panchromatic types.

While it is true that Wratten filters No. 21 to 29F are to be used with practically the same exposure factor, the results obtained with the relatively lighter filter No. 21 differs noticeably from that rendered by 29 F in contrast. The lighter the filter, the lower the contrast. In using still lighter filters, such as yellow or green filters like Minus blue, G, Aera 2, or X2, the contrast will be found to further decrease, which can be utilized very successfully by the cameraman to suit his artistic conception of how he would like to have the reproduction appear in contrast.

In conclusion, it might be mentioned that contrary to former Infra Red sensitive emulsions, the Agfa Infra Red film is much more stable as far as speed, color sensitivity, and gradation is concerned, and will keep its original characteristic after manufacturing for at least one year under normal storing conditions.

The Characteristics of Eastman's Motion Picture Negative Films

Continued from page 192

is necessary, through the Super-Sensitive to the Super X, which requires the longest time. It was stated in a previous paragraph that Super X Negative is used in far greater quantities than the Super-Sensitive Negative. While this statement is true, it should be stated here that Super-Sensitive Negative film is still available for those users desiring this type of emulsion. However, indications point to the fact that before long Super-Sensitive Negative will be completely supplanted by Super X Negative.

Before leaving this subject it might be well to give some consideration to the various characteristics of emulsions and a bearing each has upon that intangible factor, photographic quality. There are many proponents to the idea that speed in a negative emulsion overshadows all other characteristics and that high speed is the most essential quality of a high grade negative emulsion. This is not true. Speed has a definite role to play because an emulsion must have sufficient sensitivity to record adequately low light intensities; otherwise a burden is thrown upon the cameraman in the lighting of his sets. Speed, therefore, while important, is by no means the major factor to be considered in a negative emulsion from the standpoint of obtaining photographic quality. When one stops to consider that the negative emulsions of four years ago were approxi-

mately one-quarter the speed of the current emulsions, one wonders now that pictures could have been made with those older type films.

In the light of our present emulsion knowledge, Super X Negative film represents the highest speed of present commercial motion picture negative emulsions consistent with excellent photographic quality. It is quite possible to make faster emulsions but not without a sacrifice of some of the other favorable factors. Photographic quality is a condition brought about by the combination of several elements, of which emulsion speed is but one. Contrast and graininess characteristics are the other factors of major importance.

It is generally well known among photographers that high speed emulsions usually show low contrast and large grain size. In a slower emulsion, high contrast and fine grain align themselves together. This is a very important point and should be given full consideration. It is quite possible that as emulsion manufacturing knowledge advances these facts now considered laws might be overcome but in the manufacture of gelatino-silver bromide emulsions, speed, low contrast, and large grain size usually go hand in hand. The one exception to this is the current Super X Negative. This emulsion shows a finer grain characteristic than some of its slower pre-

decessors but it is extremely doubtful that a faster emulsion than Super X Negative could be manufactured without showing a greater tendency toward graininess. While it is admitted that great speed would allow for more natural set lighting, it does not follow that the quality or the resulting pictures would be better unless the negative emulsion had contrast and graininess factors comparable to those in the current type negative emulsion.

It should again be emphasized that statements relative to the possibility of manufacturing various types of emulsions depends entirely upon current knowledge. It is quite probable that as the result of more extensive research, emulsions of a distinctly different type may be conceived. If this is done, a new era in photography will begin and it will be as radical a departure from what we now consider normal as that of orthochromatic negative and mercury vapor lamps to the present type of films and the high efficiency incandescent illuminants. It is safe to conclude, therefore, that the Super X type of emulsion represents the current practical limit of speed consistent with good quality. It is not meant that speed increases of the order of 10 to 20% are not possible. When it is possible to manufacture emulsions of greatly increased speed with the other factors lending to photographic quality kept within control, it stands to reason that such a film will be submitted to the motion picture trade for production purposes.

Problems in Lensing European Projection Scenes

Continued from page 198

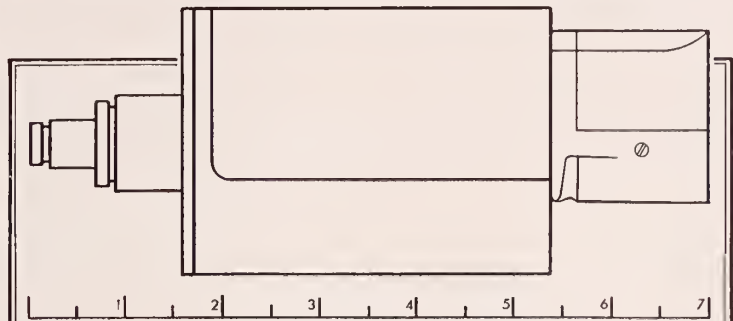
Working in London is much different than Hollywood. In Hollywood we have our own trade or professional colony. But London is so vast that the picture business is just another small industry, with its units lost in the busy city.

London public are more curious about cameras than the blasé Hollywood public. Set up a camera anywhere and crowds instantly gather. The police, while most accommodating, look with frowns on the crowd assembling. Nor will they hold up traffic for more than an instant for you.

Officials know little about picture practice, and care less. I wanted permission to shoot in the Tower. The governor refused consent for motion pictures but helpfully suggested I take still pictures—"and animate them the way the cartoon lads do."

In England you must have a permit for every camera assignment. But they are easily obtained upon presentation of credentials.

Taking camera equipment from one country to another is a problem. Going



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into England, a duty tax of one thousand dollars was levied against my equipment. I debated the figure down to five hundred and fifty. But I didn't get it back.

Other countries allow camera equipment to enter under a temporary working permit upon posting bond of approximately two to three thousand dollars. It takes five days to a week for the per-

mit to be issued. A shipping agent knows the ropes and can take care of details at minimum cost. The bond is returned when you leave the country.

Good negative can be had in London and Paris. If you go beyond these cities take your negative along with you. Local sources of supply can not be relied on.

You will find good mechanics in London, many of them Hollywood products.

Filters are of indifferent grade. Graduated glass filters are unknown. They use wet batteries instead of dry in battery boxes. With local camera motors, you dial up to speed and then hold it. Duty is so high, domestic motors are generally used.

If you are going to England or the Continent, by all means take complete equipment in your kit. Rental cameras are available, but you won't be happy with them. There are exceptions, of course. You'll be disappointed in weather conditions. I had three weeks of good photographic conditions in six months.

Schedules won't mean much. There is so much unavoidable delay. I had intended being gone ten weeks and was away six months. I traveled thirty thousand miles to get one hundred thousand feet of negative. Expenses will run well beyond your budget, and you can't prevent it. As you read this, I will be on the high seas bound for England, France, Switzerland, Austria and Italy to get background plates for Goldwyn's "Dodsworth." I am slated for ten weeks. I hope the schedule will hold. But I make no Hollywood engagements prior to next football season.

Problems of Controlling Correct Photographic Reproduction

Continued from page 197

limitations and difficulties related to the work of either part.

We hope that this communication will serve the intended purpose of encouraging and stimulating the man of practice to analyze his specific problems and to formulate from this his own ideas as to where and how the different manufacturers can help him in creating new instruments and improved products for the constant betterment of his work.




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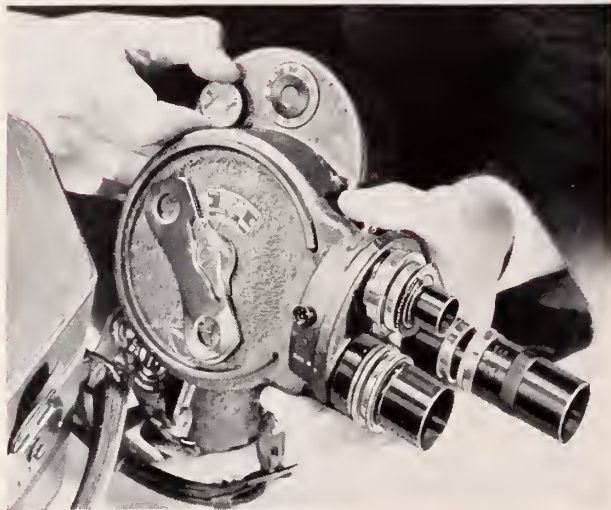


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AMATEUR MOVIES

MAY,
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Contents . . .

EUROPEAN NOTES for the Amateur Traveler By Wm. James.	210
FILMING AN Aztec Festival in Kadachrome By Xavier Frias.	212
SURELY YOU'LL Shoot the Circus By Barry Staley.	213
MAKING THE March of Time By Charles Herbert, A.S.C.	214
SUBSTANDARD Miniature Shats By Jerome H. Ash, A.S.C.	216
WHEELS of Industry.	218
A JUNIOR SOCIETY.	220

Next Month . . .

- We'll tell you how they made the pictures come to life in "Curly Top." Here's something interesting you might want to try. There are several different methods outlined.
- Max Liszt, who told you all about Montage and Symbolism, will write about the ingredients of a successful picture. He speaks authoritatively because he has been a director.
- Camera angles will be discussed. You'll be told when and where to use them and how they are sometimes abused.



THERE MUST BE many photographic workers who have tentative plans for a trip to Europe in the backs of their minds but who know little about the ins and outs of the pursuit of their hobby in England and on the Continent. It is for their benefit, principally, that this collection of notes was assembled, but also for those armchair travelers who enjoy fresh, first hand information. The writer has spent the entire summer and autumn of 1935 with both cine and miniature cameras in eleven countries of Europe: France, England, Switzerland, Germany, Holland, Belgium, Italy, Austria, Hungary, Yugoslavia and Albania.

First concerning what equipment has been found to be most practical from personal experience and from the observation of other travelers. Miniature cameras are even more popular in Europe than in America; one sees them exceedingly often. It appears that, quite naturally, those who have them take the most pictures, since the larger cameras are so much more costly to operate and more trouble to prepare for action. Then, too, there is a great temptation with a larger camera to "leave the camera at the hotel, we won't see anything worth taking." It is usually on such occasions that one finds, regretfully, the finest picturing making opportunities. With a miniature camera, whose weight is hardly noticed, the temptation to go camera-less is greatly minimized.

The same rule applies to motion picture cameras. Don't make the mistake of carrying one of the large turret model multi-lens cameras through Europe. These instruments are, of course, the very finest obtainable for studio, location, and around-home work but for travel purposes, unless one be a professional or semi professional traveling slowly and with the express purpose of making movies, they will be found far too bulky and heavy.

It is not once in a hundred shots that the average traveler has occasion to use a telephoto lens; even when an occasion does present itself there is seldom available a sufficiently firm support for the camera. A wide angle lens, on the other hand, is very often of use, and in addition to a wide aperture normal focus lens will be found adequate to meet practically all filming conditions encountered in traveling. The time and trouble necessary to screw in lenses will be found fully compensated for by the saving in bulk, weight, and expense gained by the omission of the turret.

European

Reverse motion, multiple speeds, and other extras might occasionally be found useful, but the average traveler would do well to spend the time he would otherwise devote to the operation of these non-essentials to a careful selection of material and the planning of sequences.

To summarize, the ideal outfit would seem to be a miniature camera using a readily obtainable size of film cartridge; a lightweight 8 or 16 mm cine camera equipped with normal focus and wide angle screw-in or clamp-on mount lenses; filters; and a photoelectric exposure meter.

Next, as to customs formalities with regard to cameras and equipment. The writer carried in his luggage up to 1500 feet of 16mm film, 500 feet of 35mm film for loading into a miniature camera, and developing equipment for the miniature films, in addition to the two cameras, and no difficulty was experienced at any frontier, although customs officials often desired to know the purpose of the equipment. The right of each country to demand a bond equal to the customs duty was never exercised.

The most important fact with regard to customs is that all photographic apparatus must, for the protection of the owner, be declared. If declared, it is, in the experience of the writer, always passed through free of duty, but if not declared and later found, it is almost sure to be confiscated and with no hope of recovery save by repurchase at a high figure.

Thirdly, it is important to bear in mind that there are restrictions upon the photography of certain subjects in Europe, just as at home. These usually work no great hardship upon the amateur, but they should be constantly borne in mind. Due to the unsettled conditions in some parts of Europe, much trouble could be caused the photographer who unthinkingly takes a picture of a fortress.



Notes for the Amateur Traveler

by
William James

The principal specific restrictions are as follows: It is forbidden to make any photographs whatsoever from a moving airplane in any part of Europe. Forts, military works, military lands, and in some countries even railway stations, trains, and bridges are taboo. It is well to obtain specific permission to photograph parades, troop movements, or military men, as it is forbidden in some countries and perfectly allowable in others. Art galleries, museums, and cathedrals usually demand that special permission be obtained and a fee paid if one is to photograph works of art or objects of interest.

One should bear in mind if one's tour includes Italy, that all film which is to be sent by parcel post from Italy must be censored in Rome, which is both costly and bothersome. Film which is to be carried out as baggage does not need to be censored.

Unprocessed cine film, if it is of American manufacture and purchased in America, may be sent back to the United States for processing free of duty. Upon processed cine film, however, duty must be paid if it is sent by post, but all films in reasonable quantity, whether processed or unprocessed, are admitted free of duty if brought in as baggage.

Film will be found available in all the popular sizes in both American and European brands in nearly every town and city in western and central Europe. This includes daylight loading cartridges for 35mm cameras. Sixteen millimeter cine film is available only in the larger cities, and will be found to be more expensive than at home, and unless one obtains Kodak or Agfa one is never quite sure of the speed or the uniformity of the emulsion.

Fine grain processing stations for miniature negatives are to be found in western Europe with much greater frequency than in America, particularly in Germany and the German countries. The charges average about 25 cents for a five-foot roll. It hardly pays, at this rate, to attempt to do one's own processing as one goes along. The chief difficulties are: the formation of precipitates by the water in most cities when developer powders are dissolved in it; the impossibility of exact control of temperature so essential with tank development; and the time necessary, which must usually be stolen from other pleasures.

Light conditions will be found to be practically the same as in our northeastern states, with the exception that, in northern and central Europe the days in summer are much longer and in winter much shorter. There is sufficient light to make exposures on fast film with a wide aperture lens until nine in the evening in Paris and London in early summer, while farther north the day, of course, get progressively longer. In the winter, however, there is seldom sufficient light in these cities to do any serious work after three or four in the afternoon.

Perhaps the most important topic of all is what to expect with regard to picture material. First and foremost, don't expect to find natives in picturesque garb in the traveled parts of western Europe. Even in the small towns it is a rare occasion indeed when one sees a native costume. If one wishes to find this type of material it is necessary to go into eastern Europe, especially to the Balkans. Here one will find the last stand of the picturesque costume, which even here is rapidly vanishing.

Some welcome exceptions to the above generalizations are luckily met. In Austria and in Bavaria the men still unaffectedly wear their short leather knee breeches and "Tyrolese" hats, while the women, especially in the smaller towns, tend toward brightly colored and decorated dresses. In Belgium one sometimes catches a glimpse of a woman with voluminous black dress and lace cap.

In Holland one has the tourist towns of Marken and Volendam to fall back upon to get "quaint" material to satisfy "the folks back home". The ancient fishing villages, easily accessible from Amsterdam, have preserved their traditional costumes and way of life and now make their living from the tourist trade. They are so highly commercialized that they have lost much of their charm, but there is picture material in great abundance. It is altogether likely that the natives will demand a fee if they catch one photographing them. With a small cine camera or a miniature camera, however, one can usually "steal" a large number of shots, and these, being unposed, will be more interesting than the usual type in which the natives are apt to pose woodenly. It is particularly disconcerting to have them "strike an attitude" when one is attempting to get natural-looking movies.

There are still a few old fishing villages on the Zuyder Zee, most of them rather inaccessible, where the people still preserve their ancestral dress because of their innate backwardness and conservatism. The people are likely to be unfriendly and hard to photograph, but the results would well repay the trouble of a visit.

In Hungary, bordering as it does on eastern Europe, the

Continued on page 223



Filming an Aztec Festival in Kodachrome

by
Xavier Frias

MEXICO, my homeland, is rich in color. During the past few years, a revival of interest in the art and traditions of the ancient Aztec and Toltec civilizations has added to this. Throughout modern Mexico, the colorful heritage of Spain intermingles with the equally colorful Aztec influence. The result is a picture thoroughly Mexican: not wholly Spanish, by no means Indian in the generally accepted North American meaning of the word, and entirely charming.

For a long time I had cherished an ambition to make motion picture records of Mexican tradition and folklore, but not until the coming of Kodachrome did I dare attempt it. Any medium that ignored the living color of the scene would be sadly inadequate. But after seeing my first roll of Kodachrome, I knew there was available a process which would give me the pictures I wanted, and which was safe in my none too experienced hands.

At the same time, there arose an opportunity to begin by filming an unique Toltec festival, revived for the first time in over four hundred years. This festival dramatizes the ancient Toltec myth, "The Creation of the Fifth Sun". According to Toltec tradition, four suns had successively shone on Mexico, each as it died being renewed by the Gods. When the fourth sun expired, however, no successor appeared, and the land languished in darkness. All the invocations of the priests were in vain. Finally one of the High Priests cast himself into the sacrificial fire, and was reborn as the fifth sun. Last summer, twentieth-

century Mexico re-enacted this pageant among the ancient Toltec pyramids at Teotihuacan, reconstructing ritual, costumes and pageantry with scientific accuracy. I resolved to film it in color; and by careful planning, I succeeded in capturing a Kodachrome record of the whole performance.

Here is how I went about it. First, I attended the many rehearsals of the pageant, familiarizing myself with the action. When the final rehearsals were held at the pyramids, I made it a point to be there, planning my scenes and angles. By this time, I was almost as familiar with the play as were the actors!

But it is one thing to familiarize yourself with the action of such a pageant, and quite another thing to photograph it when it is being performed before a vast crowd. The next step, therefore, was to assure myself of official co-

Continued on page 224

Surely, You'll Shoot the Circus

by
Barry Staley

THE CIRCUS IS COMING TO TOWN!" A clarion call to every small boy—and to every amateur cinematographer. Here is a colorful spectacle providing an uncommon photographic subject. The circus is deep-rooted in boyhood tradition. Don't let your camera miss it. You'll have a chance to get many unusual shots, and the completed film will be a constant favorite with the children.

To have it an interest-holding bit of screen entertainment rather than merely a series of topical views, let's weave a story into it. Here's a suggested scenario that will give you good continuity and bring family personalities into the picture.

MAIN TITLE: CIRCUS TRAGEDY.

SCENE 1: (It is early morning, dawn. Use a Diffusion Filter and shoot it in full sunlight.) **LONG SHOT** showing the side of your home. Your small son's bedroom window is open. A string, weighted by a stone, extends from the window to the lawn. A young boy, a friend of your son's, runs rapidly into the picture and to the dangling string.

SCENE 2: **MEDIUM SHOT** of the side of the house below the open window. The string is now plainly visible. The young boy runs in to it, stops, and breathlessly takes hold of the string.

SCENE 3: **CLOSE SHOT** of the boy's hand tugging at the string in short, strong jerks.

SCENE 4: **CLOSE SHOT**, panning up along the line of the jerking string until it is seen to enter the open window.

SCENE 5: **MEDIUM SHOT** of your son's bedroom. He is in bed, sound asleep. The alarm clock registers the hour as six A.M. The string leads in through the open window to your son's big toe which is seen sticking out from under the covers. The string starts to jerk violently.

SCENE 6: **CLOSE-UP** of your son's exposed foot. The string is wound around the big toe and tied with a large knot. The jerking string is actively yanking at the captive toe.

SCENE 7: **CLOSE SHOT** of your son suddenly awakened. He grabs for his toe, and the string.

SCENE 8: **CLOSE SHOT** of your son jumping out of bed, string in hand, and going to the open window.

SCENE 9: (Exterior) **MEDIUM SHOT** of the open bedroom window. Your son is seen signalling out of it, cautioning silence, to his friend below.

SCENE 10: **CLOSE SHOT**. In the bedroom, your son flies out of his pajamas preliminary to fast dressing. **FADE OUT.**

SCENE 11: **FADE IN** on a **LONG SHOT** of the circus



grounds with all the circus paraphernalia arriving. The two boys run in and scan the scene eagerly.

SCENES 12 TO 15: **MEDIUM SHOTS** of interesting circus procedure; unloading animal cages, erection of tent poles, etc.

SCENE 16: **MEDIUM SHOT** of the elephants. The boys come in and gaze at the big beasts admiringly.

SCENE 17: **CLOSE SHOT** of elephant drinking water from open trough.

SCENE 18: **MEDIUM SHOT** of the boys watching, fascinated, the drinking scene. A circus workman enters carrying two pails of water. He empties them into the drinking trough. Seeing the boys, he beckons to them.

SCENE 19: **CLOSE SHOT** of the workman giving the pails, one each to the two boys. They scamper away in the direction he points.

SCENE 20: **CLOSE SHOT** of the two boys filling the pails with water from a hydrant or other water supply.

SCENE 21: **MEDIUM SHOT** of the boys hurrying back to the elephants with their pails full of water.

SCENES 22 TO 25: **MEDIUM and LONG SHOTS** of circus activity. The seats are being placed, the "big top" goes up, the animals are being fed.

SCENE 26: **CLOSE SHOT** of the boys lugging their water pails. Their first enthusiasm has worn out and the pails are getting heavy.

SCENES 27 TO 30: **MEDIUM and LONG SHOTS** of the circus. The tents are now up, banners flying, the sideshow signs flamboyantly depicting attractions of its freaks.

SCENE 31: **CLOSE SHOT** of the boys. They are very weary and tired. They are using but one pail now, and laboriously carrying it between them.

SCENES 32 TO 35: **MEDIUM and LONG SHOTS** of the crowd arriving at the circus; at the ticket wagon, listening to the sideshow barker, entering the turnstiles.

SCENE 36: **CLOSE SHOT** of the boys and their water

Continued on page 222



Charles Herbert, A.S.C.

MANY PEOPLE have wondered, since the first March of Time was flashed on the screen more than a year ago, where it is filmed, how it is filmed and how much of the content is made in regular motion picture studios.

The production of each March of Time episode includes most of the mediums which go into the ordinary newsreel, the feature picture and the travelog. Once the subject is selected and the story written in the first form, the editors map out the necessary sequences. It is often possible, in tracing past events, to secure certain stretches of film from libraries. For all current material camera crews are sent out and for reenactment, sets are built and the scenes are shot in a regular studio.

Examples of these various techniques may be found in almost any episode. Take the munitions sequences of the third issue for example. Senator Nye and members of his committee worked with March of Time's crew in filming their scenes. It was not so easy to get old Sir Basil Zaharoff, mystery man of Europe. Now an old man of 85, he is the most difficult person in the world to photograph.

The March of Time cameraman dispatched from Paris to get pictures of Zaharoff was well aware of the difficulties facing him. By posing as a taxi driver with a camera concealed in the cab, he obtained pictures of the munitions king descending the hotel steps, driving off in his car. When rumor had it that Zaharoff was planning to leave the Riviera for an unknown destination, this same cameraman got himself a job as pushcart peddler of refreshments at the railroad station. When the munitions king appeared in a wheel chair, he sauntered by, offered his wares to the plain-clothes man, while an automatic camera concealed among the oranges took the pictures which were later seen exclusively in the March of Time.

Most episodes, in addition to having national or international news importance, have some bit of human drama as an integral part of the story. For instance the CCC story which was released in the sixth issue starts with a mass meeting of the citizens of the little town of Elmsford,

Making

in protest against the invasion of CCC into their well-regulated community. This issue was reenacted and to make it as nearly perfect as possible, the citizens of the town were called upon to take the part of the crowd. Actors from a near-by summer theater took the principal speaking roles including those of an Army captain and a chief of police.

The town hall meeting scene of this episode was made in the regular Tawn Hall and complete lighting equipment was installed. To make scenes depicting the rowdy element in the CCC ranks, the March of Time faced a problem. While the script called for these scenes and the editors were convinced of their importance, the Government officials were opposed to them.

Eventually March of Time was allowed to take the scenes in an authentic CCC mess hall. Later the CCC arranged forest fire scenes in the episode.

To do this great care had to be taken to see that the fire would not be a risk to the National Forest area. Under the expert supervision of the Forest Rangers, a cleared area was selected far away from the main body of the forest and a strip of forest was actually built. Trees were cut down and brought to the cleared area, holes were dug, and the trees were stuck up in as nearly natural positions as possible. Brush and grass were replanted and even old dead snags were mixed in with the green trees. Fire-fighting apparatus was brought out to stand by in case of an emergency, the area saturated with quick-burning liquid, and the stage was set. Two cameras were trained on the best locations, the fire started and as soon as it was going, CCC boys came up and did their job of putting it out.

Whenever a March of Time crew goes out on location, the men are prepared for most any kind of a job, with lights, electricians, carpenters, cameramen, soundmen, assistants, directors, etc. As much care is given to the production of scenes as goes into the making of regular feature pictures, each person faithfully doing his part in creating life-like action and sound on the film. Most scenes are made from every angle possible and when the developed film reaches the projection room for consideration by the editors, it must undergo a most critical scrutiny. The editors, not content to make their selection of scenes by merely viewing them as they come out of the camera, select several of the best takes, have them cut into the body of the proposed subject and then after reviewing the sequences over and over, select one which best tells the story in quick, sure-fire March of Time style.

Exterior scenes representing the full scope of Tennessee Valley Authority activities required two months of painstaking work over 8,000 miles of hill country in Tennessee, Kentucky, Alabama, and Mississippi. Every phase of work was covered and no scenes were made until location and backgrounds were checked to determine the one best suited to tell its particular story. As many of the striking activities were in isolated regions, it was necessary to travel over seemingly impassable roads.

The March of Time outfit which made this subject was equipped with a specially designed truck capable of negotiating the worst of field conditions. All built-in features for housing and operating the equipment were embodied in the design and construction of this truck. A removable top enabled the cameraman to stand in the

the March of Time

by
Charles Herbert, A.S.C.

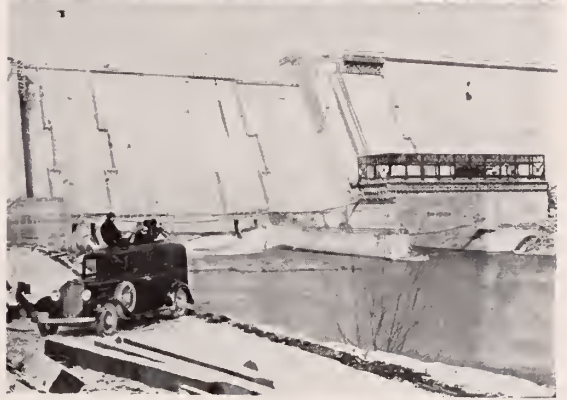
truck with the upper half of his body outside and the camera mounted securely in a built-in turret mount. When shots had to be stolen without knowledge of the people being photographed, the camera was mounted rigidly inside the truck and shots were made through a small sliding panel in the side. Various means of swinging the microphone into position were also provided. This truck will carry four people comfortably, a large supply of raw stock, complete lighting equipment for interior jobs, all kinds of tools for repairs to equipment and for use in preparing locations, special camera mounts, full sound recording equipment, plenty of baggage and still it is only a half-ton job.

The Ethiopian sequence in the sixth issue presented some unusual difficulties. As the threat of war became more and more pronounced and newspapers and newsreels started correspondents heading toward Ethiopia, this subject was selected as a definite part of the issue. How it should be presented remained a problem. Days went by and the rapidly developing events changed the story's importance time and time again. Finally the oil concessions and the news scoop by James Mills offered the real peg on which to hang the story. March of Time's cameraman was already in Ethiopia and a first shipment of film was on the way.

Realizing the importance of the coming crisis, the editors set about the long task of combing the library for scenes that might have bearing on the subject. They wanted to include the underlying causes of the conflict and show the nations involved. Although scenes of Lake Tana were needed, it was a problem to find them as the cameraman could not possibly make the trip to the mountains and return the film in time for the deadline. Also they could not afford to leave the hub of activity in Addis Ababa. Scenes of Abyssinia which would convincingly show what the country and its people were like were also needed, as were scenes of Assuan Dam and the River Nile, Gibraltar, and the Suez Canal.

Film libraries were canvassed and every lead was followed. Film from Ethiopia arrived but bad photographing weather had reduced its quality to uselessness. Occasionally an outstanding scene was found as hundreds of reels were projected. When the oil story broke there was a temporary relief from the seemingly endless inspection of existing film.

Newspapers carried a story of the strategic manoeuvre of Emperor Haile Selassie to cede away the fruits of conquest even before the conflict started. The first story of this important event was a world-wide scoop by James Mills. March of Time decided to reenact this scene. While news stories told how and where the signing happened, they left the public without a clear idea of how the stage looked. This was the cue that started every available man on the



"March of Time" camera crews in back country of Tennessee shooting "TVA" story. At bottom: At Norris Dam in Tennessee on "TVA" story.

March of Time staff searching for information about Emperor Haile Selassie's Palace, how he looked, how his retainers dressed, what the hotel and telegraph office in Addis Ababa looked like, how the reporter and attendants dressed and a score of other details.

The reception office on West 54th Street was turned into a casting bureau as a stream of prospective doubles poured in. Retainers and minor characters were easy to select, but the Emperor, Rickett, Calsan and Mills required care. A half dozen prospective Emperors were made up, viewed from every angle and under all lighting conditions. Then they were photographed on film and considered by the editors in the projection room. Jews, Italians, Syrians, and others were tested. None of the prospects made an impression on the editors until some one spotted the real Emperor right in the office. A young man in his twenties just starting out with the organization was made up and won the honor of being THE EMPEROR.

Before sets were prepared, extensive search was made for photographs showing construction details of the interior of the Emperor's study and the Imperial Hotel. As none were available a search was made for people who had seen the buildings. One of our soundmen had been in Ethiopia at the time of the coronation several years ago and his memory was taxed to get details of construction. Several negroes from Harlem were located who had some information about the hotel and a doctor who had spent many years in Addis Ababa filled in the gaps in a string of facts which made it possible to build sets closely resembling the real thing.

When the sets were completed, all the selected characters were called in and work started on the making of

Continued on page 223



Substandard Miniature Shots

by
Jerome H. Ash, A.S.C.

IN SEVERAL RECENT RELEASES, we have seen real people walking through miniature streets, and being crushed by the fall of miniature houses. We have seen real people acting against a background in which miniature trains, ships and airplanes moved. We have even seen real people acting on sets which were partly constructed in miniature.

Inevitably, amateur movie makers have asked whether or not they could film miniatures with their 16mm and 8mm cameras.

Well, some types of miniature work are possible with substandard equipment; others are out of the question until some manufacturer comes out with a camera incorporating such indispensable features as full-frame focusing

directly through the film-aperture, a faster "slow-motion" speed, and so on. Even then, the more advanced types of composite photography, with which the professionals combine miniatures and full-scale scenes into a single shot, will have to remain on the amateur's doubtful list.

But all that is in the future: what can the home filmer do now, with the equipment he has today?

Generally speaking, the best type of miniature for the amateur filmer to tackle is what we can call "miniature inserts". Fairly distant shots of miniature trains, airplanes and ships, in which no people figure; and wrecks, crashes, and so on.

Let's begin with a few general rules about photographing miniatures. In the first place, always use your highest "slow-motion" speed. Photographing a miniature at an abnormally fast taking speed not only makes the pictured train, ship or airplane move more slowly, but it smooths out any irregularities in the motion, and somehow adds an illusion of mossiveness and actuality. Second, always shoot your miniature from a relatively low camera-position: the lens should be, relative to the miniature being photographed, at about the level of a man of a size proportional to the scale of the miniature. To simplify the problem of set-building (the set should always be simple), it is preferable to make the miniature a night-effect shot, if possible. For much the same reason, the set should be lit rather flat while the miniature itself is lit with rather more contrast than usual; a fair degree of diffusion should be used. Lastly, wherever possible, the miniature should be under complete physical control during the shot.

Now, let's get more specific! Take the matter of miniature trains, for example. There are two types of miniature railways, both of which are more or less readily available to the home filmer. The first, of course, is the toy railway equipment the children look forward to at Christmas. The cheaper sort of toy trains aren't at all suitable for movie miniature work, but some of the better-class outfits—especially two or three accurately-scaled reproductions of various streamlined trains—should make pretty fair miniatures. Most of these outfits operate by remote control, which is a distinct advantage. Two kinds of track are available for them: the ordinary tubular "tinplate" track, and some with solid rails, which is quite realistic. These trains pick up their power from a third rail between the two running rails, so the camera must be used at an angle that won't reveal this rail.

The ideal trains for miniature-shots are the true scale-models. These are absolutely exact reproductions of real engines and cars, built to a scale of $\frac{1}{4}$ " to the foot. You can buy these miniatures commercially; but they are expensive. You can build them, or assemble them from kits, at less cost. And in almost every city, you can find men (some of them pretty distinguished citizens, too), whose hobby is building and operating these models; in the larger cities, you are almost sure to find model railway clubs. Properly approached, these people will gladly cooperate with you. Many of them have extensive layouts, complete with accessories and scenery.

Assuming you've got your train, the next thing is to photograph it. Your camera job will be much easier if the tracks are run along a bench, as in most scale-model layouts. This not only eliminates the back-breaking necessity of sprawling along the floor, but enables you to put your camera easily in the scale "eye-level" position that gives the best perspective. Supposing, too, that the model layout you use has some scenery, but no proper background, the simplest way to secure a proper sky background is to use a miniature version of the professional "sky backing". This is simply a sheet of white cloth stretched be-

Continued on page 226

Better

BRIGHTER MOVIES, WITH THESE EASTMAN HEADLINERS



KODASCOPE, MODEL E

Magazine Ciné-Kodak is the new 16 mm. camera that loads in 3 seconds. No threading—the film comes in magazines. “Pan,” Super Sensitive “Pan,” and Kodachrome Film magazines are instantly interchangeable—even when but partly exposed. Magazine Ciné-Kodak may be operated at half speed, normal, or slow motion. Its new design finder system competently serves the standard lens and four telephotos. These, and its many other advantages, have made it the fastest-selling 16 mm. camera almost over night. \$125, with Kodak Anastigmat $f.1.9$ lens, at Ciné-Kodak dealers’.

Kodascope E, amazingly low in price and possessing exceptional brilliance and adaptability, already paces the 16 mm. projector field. It may be used with your choice of four “fast” lenses (1-inch to 4-inch), and three brilliant lamps (400-, 500-, and 750-watt). Little wonder that wise movie makers are buying the “E” at only \$54.50 or slightly higher, depending upon lens-lamp selection.

EASTMAN KODAK COMPANY, ROCHESTER, N. Y.



WHEELS OF INDUSTRY

Medical and Dental Films Catalog

● Bell & Howell Company has ready for distribution a new edition of its Medical and Dental Films Catalog—a listing of 16mm films on medical, surgical, health, dental, and hygiene subjects which are available, from their respective sources, for loan, rental, or purchase. Physicians, surgeons, dentists, nurses, teachers, and cinematographers generally, will find the catalog of interest and value.

Some three years ago this company issued its first catalog of medical and surgical films. It consisted of some twenty pages. An indication of progress and increased interest in motion pictures in this field is to be found in the fact that the new catalog lists approximately three times as many medical and surgical films as did the first one. Dental films listings have increased in like proportion.

Significant is the appearance of a number of sound films among the silent films listed in this catalog. Beginning with the American College of Surgeons' original sound films on good hospital care, there are now several 16mm films available on the medical and dental fields, as shown in this catalog; and the number is rapidly increasing. The Hennepin County Tuberculosis Association of Minneapolis now has a two-reel sound film, "Contacts". In the field of child psychology a dozen sound films on Dr. Arnold Gesell's work at the Yale Clinic of Child Development are now available. In dentistry Dr. George B. Winter of St. Louis has made a sound film on the removal of the impacted third molar.

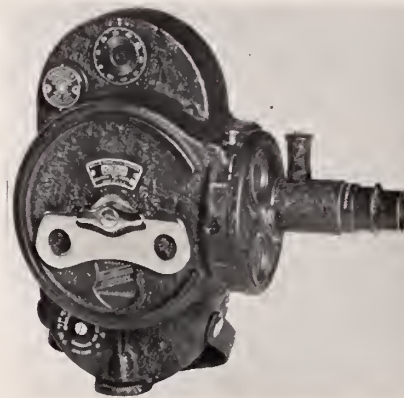
The contents of the new catalog fall under the following headings: (a) Medical and Surgical Films for Professional Use Only, (b) Health and Hygiene Films for National Distribution, (c) Health and Hygiene Films. Limited Distribution, (d) Non-medical Technical Films. (e. g. "Behavior of the Feeble Minded," "Determiners of Attention"), (e) Dental Films for Professional Use, (f) Dental Films, National Distribution.

The new Medical and Dental Films Catalog consisting of 58 mimeographed pages 8½ by 11 inches, with cover, will be sent on request to Films Division, Bell & Howell Company, 1801 Larchmont Avenue, Chicago, when the request

is accompanied by 25 cents in stamps to help defray the cost of preparation and mailing.

New Focusing Device

● Arthur Wolf of Chicago has announced a very handy accessory for the



serious worker in movies. This he has named the Optiast and is for focusing the lens and also viewing the field to be photographed. By looking through this optical arrangement through the lens the cinephotographer can definitely line-up his shot so that it is properly composed—so that he takes in only what he wants to take-in or in the case of titles or inserts he can properly center and frame them.

For those who must do definitely close-up work and they have no means of parallaxing the Optiast will undoubtedly prove very valuable.

Wolf makes them in several different models to fit the more popular type of cameras.

New Kodachrome Film

● Eastman Kodak Company announces a new type of Kodachrome film for use with artificial light.

Heretofore, in order to obtain satisfactory interior exposures with regular Kodachrome, the amateur had to use more light than the average house is fused to carry, and a blue filter was necessary to compensate for the redness of artificial light as compared with daylight. With this new type of Koda-

chrome, which is extremely blue sensitive, no such filter is necessary.

The film is about four times the speed, or two diaphragm openings faster than is the regular Kodachrome with artificial light and filter.

The new film is said to produce much more satisfactory color results by artificial light than have been possible before.

It is claimed to be fast enough to make pictures of illuminated street signs at night. Satisfactory exposures of such subjects can be made at f. 1.9 at the regular camera speed of 16 pictures a second.

The introduction of this film will also interest photographers engaged in medical work and indoor professional work. Heretofore, the medical photographer working with the aid of artificial light has had to use the compensating filter to obtain necessary color correction.

This new film, designated Kodachrome Film, Type "A", is balanced for the light of the inexpensive and readily available Photoflood lamps but will also render very excellent results with new regular tungsten filament lamps. For white flame carbon arcs the regular daylight Kodachrome film should be used. Since the new film is extremely blue sensitive, care must be exercised to exclude all daylight from the room when artificial light pictures are made.

Type "A" is similar to the regular daylight Kodachrome in that exposures must be judged fairly accurately to obtain the best results, and also the subject contrast must be kept low by the use of soft, flat lighting. This is because Kodachrome is very sensitive in registering slight differences in light and shade, or in shades of color; hence, the contrasty lighting commonly used for black and white pictures is not suitable.

An exposure guide for Kodachrome Artificial Light Film Type "A", with Eastman Kodaflectors accompanies the film. Type "A" may be also used in daylight with an orange filter to compensate for its blue sensitivity; its speed to daylight with the filter being about the same as regular Kodachrome without a filter. This filter will be available in the near future. The price of Type "A" is the same as regular Kodachrome film.

Continued on page 228



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THE AMERICAN SOCIETY OF CINEMATOGRAPHERS has organized a junior branch of its association for the amateur to be known as the SOCIETY OF AMATEUR CINEMATOGRAPHERS.

FOR MANY YEARS amateurs have been requesting the American Society of Cinematographers to form an organization for them that would be representative, authoritative and instructive.

WHILE IT WOULD be easy to form such an organization in the spirit of enthusiasm that usually accompanies such pleas, but to insure the continuance of such an association it needs real ideals and a constructive policy.

THE SOCIETY OF Amateur Cinematographers is not a society to give to the amateur letters to be used after his name and it does not throw its membership open to everyone who has the fee to join. The Society of Amateur Cinematographers is based on strict and sensible requirements.

FIRST, THE APPLICANT must own a camera; second, he must have made motion pictures, and third, he must submit a picture to the reviewing board which is made up of members of the American Society of Cinematographers. This does not mean that the amateur is going to be judged by 100% professional standards as practically every member on the reviewing board operates either an 8mm or 16mm camera and is familiar with the shortcomings of the amateur's equipment.

WHEN AN AMATEUR has been admitted to the SOCIETY OF AMATEUR CINEMATOGRAPHERS, it is a sign of achievement; it is an indication that he is truly an amateur cinematographer, and he knows

SOCIETY

that his fellow members are active and accomplished amateurs. Also he is being guided by experts, by the acknowledged camera masters of the world, by Hollywood's greatest directors of photography.

MEMBERSHIP will include a subscription to the "American Cinematographer". It will also include the use of the outstanding films made by members of the Society of Amateur Cinematographers. As films are submitted, the best will be duplicated and an analysis prepared by a member of the American Society of Cinematographers. This analysis will go with the picture and the picture will be available to any member of the Society of Amateur Cinematographers.

FOR THE MOST outstanding members and the most able amateur cinematographers, a fellowship will be created, giving that amateur the title of Fellow of the Society of Amateur Cinematographers. Requirements for Fellowship will be announced later.

MEMBERSHIP IN THE SOCIETY of Amateur Cinematographers gives each member access to the film library, privilege of asking questions, and advice on all branches of movie making.


AS THE SOCIETY GROWS, it is the plan to create branches in other centers to be made up of members in those cities. In Hollywood a branch will be created and the programs originated here will go forward to other branches as a unit.

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Cinematographer**
6331 Hollywood Blvd.
Hollywood, Calif.

Surely, You'll Shoot the Circus

Continued from page 213

pail. The job is proving beyond their strength. They sit down, utterly fatigued.

SCENES 37 TO 40: MEDIUM and LONG SHOTS of the circus crowd, thronging the entrance. Back around the dressing tent, clowns and other players can be seen in costume. The circus is about to begin its performance.

SCENE 41: CLOSE SHOT of the boys. With great effort they empty their water pail into the trough, slump exhausted to sitting positions and lament their condition.

SCENE 42: MEDIUM SHOT of the circus workman approaching the boys. He gives them their two promised tickets to the circus. Rewarded, the boys forget their fatigue and race merrily to the entrance gate.

SCENE 43: MEDIUM SHOT of the boys, tickets in hand, entering the circus portals, eagerly expectant.

SCENE 44: CLOSE SHOT of the boys taking their seats in the circus.

SCENE 45: LONG SHOT of the elephants doing their trick act.

SCENE 46: CLOSE-UP of the boys' faces, entranced at the sight.

SCENE 47: LONG SHOT of another circus act.

SCENE 48: CLOSE-UP of the boys watching. They are so tired they can scarcely keep their eyes open.

SCENE 49: LONG SHOT of another circus act.

SCENE 50: CLOSE-UP of the boys. They are fast asleep in their seats. FADE OUT.

SCENE 51: FADE IN on MEDIUM SHOT of crowd milling out of the exitway. The circus is over.

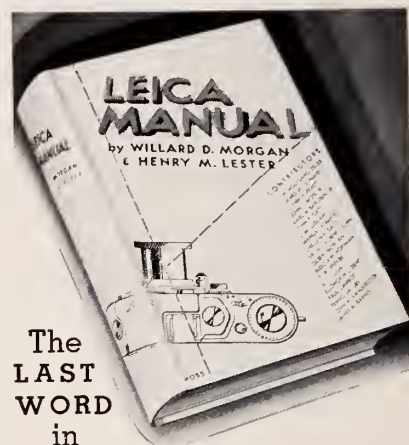
SCENE 52: CLOSE SHOT of the sleeping boys.

SCENE 53: MEDIUM SHOT of the sleeping boys alone among the vacant tiers of seats. A circus attendant enters and gently awakens them.

SCENE 54: CLOSE SHOT of the sleepy boys leaving the circus. They are very disgusted for they have slept through the entire performance.

SCENE 55: MEDIUM SHOT of the two boys making their weary way homeward. Their attitudes speak eloquently of the catastrophe of the unseen circus. FADE OUT.

By being on the scene the morning of the circus' arrival, you will experience no difficulty in getting these shots. The water-carrying episode can easily be arranged. Water for the elephants is such a legend of the circus that almost any attendant will gladly co-operate. Select the various circus scenes for their general interest and pictorial possibilities. The close-ups of the boys you can get later, if necessary, shooting



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against a neutral background or at a nearby baseball park that has seats of the circus sort.

If the interior of the circus is not quite light enough for sharp camera work, so much the better. Give plenty of exposure and you'll capture the atmosphere of the circus itself.

Making the March of Time

Continued from page 215

the reenactment scenes of the signing of the treaty, the hotel lobby, the hotel room scene, the meeting of Mills and Rickett and the telegraph office.

Most of March of Time's pictures, contrary to an earlier rumor, are taken by its own camera crews. Its men have covered the country photographing ex-President Hoover in California, a dope ring in New Orleans, CCC camps in Vermont, to mention a few places.

Abroad the March of Time has sent Julien Bryan to Russia, Japan, Manchukuo, and China for some of the best pictures so far to come out of those lands. In Palestine, I filmed the pictures used in the episode based on that country.

The subject has been called by many reviewers the chief innovation of 1935 in the short subject field. It is not competitive to newsreels although it has brought about audience comparison. It has established a reputation for news interpretation and exposition and in its editing and presentation it has undoubtedly achieved a brilliant success. The main thing to be desired of it in the future is that its second year will live up to the promises fulfilled in its first.

European Notes for the Amateur Traveler

Continued from page 211

small towns provide a gratifying amount of material, but the cities and resorts will be found to be standardized with regard to dress. In the Balkans little Albania is probably as unexploited as any country on earth photographically. It remains so unspoiled that it is practically impossible to look in any direction without seeing a fit subject for an interesting picture.

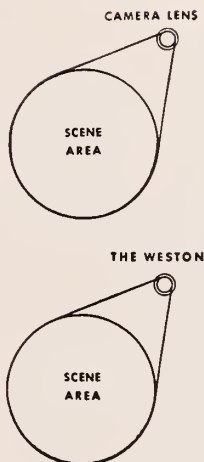
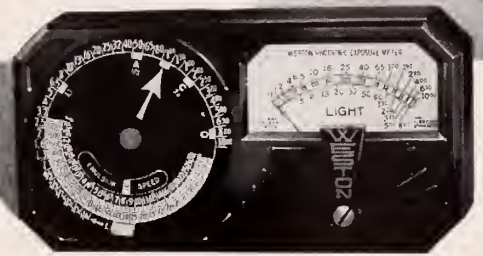
In the less sophisticated portions of Europe the market regions of any town may be relied upon to provide any amount of "human interest" material for both cine and miniature work. Since the markets are usually held in the open air, the light conditions are apt to be excellent, and furthermore the people are as a rule too busy with their own affairs to notice the photographer, who thus has every opportunity to obtain the finest "candid" material.

With regard to scenic beauty, ancient monuments and remains, and historical



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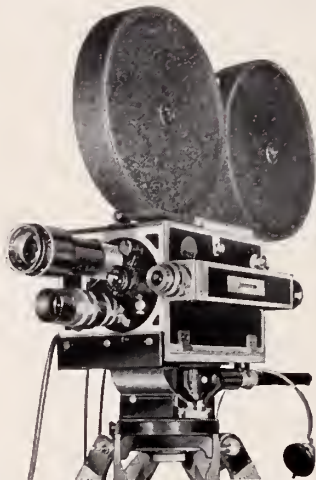
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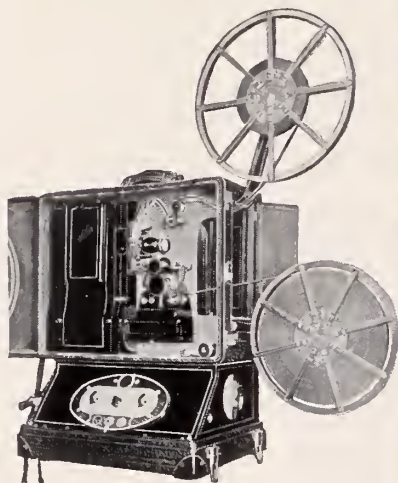


At the left—The DeVry Theatre Sound Projector—streamlined, dustproof, with silent chain drive.

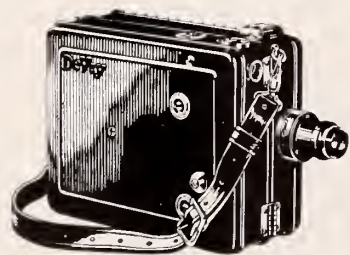


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subjects little need be said, for they present no special problems to the photographer. When they can be combined with human interest material without losing their original force, so much the better. It is well to bear in mind that the best pictorial effects are obtained with the sun relatively low in the sky; exposures made at mid-day are apt to be flat and shadowless in effect.

Finally, don't be afraid to take a lot of pictures. Film is cheap compared with the expense of travel. If you feel you may never return to a particular locality, preserve it for future enjoyment in pictures. Make an attempt to catch the spirit of each place and bear it away with you. When in London don't be content with snaps or movie shots of Westminster Abbey, Big Ben, and London Bridge. Get a candid shot of someone hopping a bus, of a "bobby" giving a tourist some directions, of an anti-cipated taxi, or of traffic jammed on the curve of Regent Street. These are pictures which live, and which tell their own story.

Filming an Aztec Festival in Kodachrome

Continued from page 212

operation. After securing the approval of the higher authorities, it was an easy matter to arrange with the officers who would police the area to hold for me two or three desirable (but inconspicuous) vantage-points.

Two or three set-ups, I decided, would suffice, for I planned to photograph only the medium-shots and long-shots during the performance. The pyramid area is too huge to permit getting good telephoto close-ups. Such close-ups, anyway, would not be satisfactorily effective, for one cannot be sure of either the composition or the technique of such shots unless he is more than ordinarily expert with tele-lenses.

Good close-ups, though, are a vital necessity—even in filming such expansive pageantry. So I arranged with several of the principal actors, and some of the dancers, to remain after the performance. Knowing the action as I did, it was easy to plan my "added" close-ups, and to film them quickly enough so that the actors weren't inconvenienced.

I also provided myself with a husky assistant to help me move my camera-equipment about soedily. The equipment itself was light: simply my Filmo, a sturdy tripod, my Weston meter, and half-a-dozen rolls of Kodachrome: but time was all-important to success, and an extra pair of hands would save much time in changing set-ups, re-loading, and the like.

Thanks to these preparations, the actual filming became a simple matter.

I knew exactly what was going to happen; I knew just which bit of action I wanted for my picture; and I shot my scenes according to plan. I couldn't, of course, plan the light-conditions in advance—but the exposure-meter took care of that for me.

My telephoto lenses were a great help in making this picture. I made most of my scenes with my 2" and 4" lenses, using the standard one-inch lens as a wide-angle objective. Interchanging the telephoto lenses naturally simplified the problem of camera-positions very greatly, for from one well-chosen viewpoint, I could reach cut and get close shots of interesting action without delay. The Filmo critical focuser proved invaluable in making these shots.

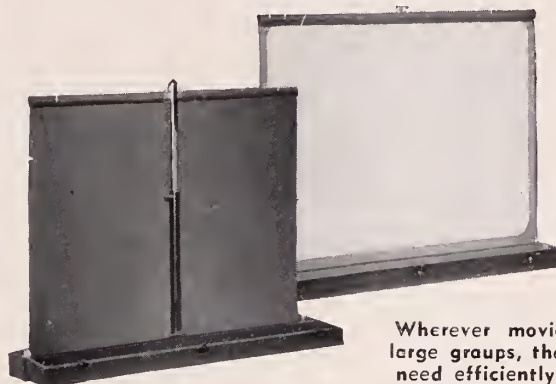
I made my scenes rather long, for two reasons. First, of course, it would make the editing job much easier. Secondly, it would show things more thoroughly, giving the eye time to take in both the action and the unfamiliar costumes and setting. And in my country, we enjoy films that move at a leisurely tempo, for our lives are not lived at so high a speed as those of our neighbors in the north.

Making the close-ups separately not only enabled me to get my scenes more easily, but to make them more effective shots. I could stage things especially for the camera, getting full benefit of lighting, camera-angles and color-contrasts in a way which would have been impossible otherwise. And there was the pleasant security of knowing that although I was getting my close-ups as I wished, I was not spoiling the pleasure of a crowd by intruding myself into a picture of life as it was lived four centuries before cameras were invented.

This same, careful planning can simplify filming pageants and festivals anywhere. In all logic, all movie-making should be done with equal care, but as long as we make movies for pleasure, most of us will photograph logically only on films we regard as really important works!

Kodachrome camerawork has by now become so familiar to most of us that very little need be said about it. From my own experience, though, I can say that an accurate exposure-meter is essential. I have heard quite a number of suggestions as to what is the best Weston meter setting for Kodachrome; I generally use a speed rating of 3, except when the light is unusually clear and strong; then I set my meter at 4. In much the same way, when my subject is dark in color, I always use a setting of 3, but when the subject is light, I've found it better to set the meter at 4.

The flatter lightings are generally best—or rather, safest. When filming people, a side lighting is very nice if one remembers to increase the exposure a bit so that the shadowed side won't vanish into inky blackness. Using a meter for



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these shots, take your reading from the shadowed side; the sunlit side will take care of itself.

In landscape long-shots, a flat lighting usually brings out the colors more vividly, though a cross-light, with long shadows, makes hills and mountains appear rounder and more natural. You can get some very effective shots if you "frame" your composition with trees or rocks in the foreground, and expose for the more distant part of the scene. In that case, the foreground, unless in direct sunlight, will be more or less silhouetted, and lead the eye to the distance.

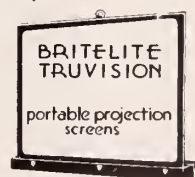
Frequently, too, I have heard people complain that Kodachrome does not reproduce the greens well. In general, this is true, though some of the more recent rolls I have seen show much improvement in this respect. Correct exposure, though, helps the greens very much indeed.

Many of my North American friends have asked me about the regulations governing the use of movie cameras in Mexico; whether films must be developed in the country, censored, and so on. These things apply solely to professional filming, for within the past few weeks, all restrictions upon amateur Cinematography have been lifted. The Government quite rightly assumes that the

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amateur filmer is a gentleman; as such, they welcome him to Mexico, and ask only that he film nothing derogatory to the country. This is understandable, for my American friends have hinted to me that even here in your country, a prying camera could find scenes no good American wants filmed, for they are not representative of your country. Mexico has not enjoyed many of the advantages you in the United States have so long en-

joyed, and it is inevitable that we, too, should have a few conditions which we do not like to see in pictures.

On the other hand, Mexico offers the cine enthusiast much that is unique—picturesque, colorful, and altogether different from one's accustomed scenes. And I can assure you, Mexico, as seen through the finder of a Kodachrome-filled camera is a photographic appetizer for the most jaded taste!

Substandard Miniature Shots

Continued from page 216

hind the miniature. The blue sky is painted in with gray paint (you can get any type of filter-correction by merely using darker or lighter paint!) and the clouds are merely unpainted white areas.

When it comes to lighting, you'll have to crowd in all the light you can get—and then use the fastest lenses and the most "super" Superpan film, for you will have to wind your camera up to its top slow-motion speed. Professional miniatures are photographed at from six to nine times normal speed. The average home-movie camera's top speed is 64 frames per second, which is only four times normal. This is not really enough; but you can "cheat" a bit, by running the train rather slowly.

The best angle is a $\frac{3}{4}$ -front view, with the train approaching. If you are using scale-model trains, you had better shoot them from the left side, as they pick up their current from an outside third rail on the right, and the engine's projecting pick-up arm on that side will show in the picture, and look very incongruous. (If you look closely at the upper illustration, you'll see the pick-ups on the engines.)

So much for trains: now for model planes. If you are the father or brother of a boy over eight or ten years of age, you probably know all about model airplanes already! There are two types: the flying and the non-flying models. The flying type are often pretty accurate as to scale, but the non-fliers, when well built, are really perfect scale models of the big ships. Naturally, they are better picture-material.

I think that by far the most satisfactory way to handle miniature plane shots is to hang the plane from wires, as the professionals do. To begin with, stretch three parallel wires well above the path you want the plane to take: these are strictly for support. From these, hang a little T-shaped wooden framework, on pulleys or eyelets; this supports and guides the plane. From the framework, three wires descend to the plane—one to each wing, and one to the tail. The three-point suspension prevents the plane from turning or flying sideways. The supporting wires may be rigidly fixed to the frame for

some types of action, but you'll have more complete control of the model if the wires extend, like puppet-strings, to where someone standing beside the camera can manipulate them, altering the level and the inclination of the plane. With a little practice, you can make the plane land, take off, climb, glide, stall or sideslip, as well as "flying" level.

Of course the wires mustn't show in the picture. You will use fine piano-wire; sometimes this won't need any camouflage. If it only needs a little, you can often hide it by a light application of blue vitriol, which gives the wire a faintly coppery tinge. Incidentally, this is best applied with a piece of cotton, rather than a brush. You simply fold the moist cotton around the wire, and do your "painting" with a wiping motion. If the vitriol treatment doesn't hide the wire, go to the other extreme—what during the war was called "dazzle" camouflage. In this application, you paint the wire in little dots of alternate black and white, each perhaps half an inch long. You'd be surprised how well this will hide a wire!

Miniature airplane shots can usually be done outdoors, which simplifies the lighting problem for your high-speed exposure. If your model is a fairly good-sized one, the set-building problem will be simplified. For the background, if your location doesn't provide an adequate sky, or if there are fences, houses, etc., to be screened the sky backing idea can be brought into play again.

Miniature ship scenes are a harder problem. In the first place, most of the ship-models you can get or assemble are relatively small—too small for really good photography; they bob around too nervously. Larger models take up more space; you need either a real lake or a swimming-pool in which to use them. And in ship miniatures, you can't "cheat" by moving your model slower to compensate for the camera's lack of speed for while you slow the forward movement of the ship, you can't slow its reaction to the ripples. And four times normal isn't nearly enough to magnify ripples into waves.

Otherwise, though, operating ship-

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models isn't so much unlike operating model planes. The ship should be towed by ropes or wires underneath the water. And as you can't move it fast enough to produce a realistic bow-wave, one can be painted on.

The problem of combining real people and a miniature shot is almost too difficult to tackle with amateur equipment. So far as I know the Cine Kodak Special is the only substandard camera (aside from the Berndt and Fearless professional sixteens) which permits focusing the full frame through the lens. But even this doesn't allow for lining up the way the professional does. Working in 35mm, we align the two shots by placing a piece of test-negative of one in the aperture of the camera, and focusing through the aperture, so that we make sure our people won't be larger than the train, and so on. Joining the two parts of the shot used to be done by various types of double-exposure and matte shots; but today it is done either by the projected background process, by optical printing, or by the Williams' or Dunning processes. None of them is particularly applicable to substandard requirements. The first two have been frequently discussed in the professional section of this magazine. The Williams' process is a process of printing through complementary traveling mattes, much after the fashion of the method suggested several months ago for making wipe-off mattes. The people are photographed against a plain background. From this negative, negative and positive mattes are made, and used in printing from the two negatives of background and people. In the Dunning process, the foreground action is photographed against a plain blue background, lit by white light. An orange-toned print of the background is run through the camera, in front of the unexposed film. The people are lit with orange light. The action of the process depends on the complementary coloring of the background and its lighting, the color of the background "plate", and the lighting on the people. The light reflected from the blue background prints a negative image of the orange-toned background plate upon the film in the camera; and where the direct image of the orange-lit people strikes the film, this prints through as though the orange-toned matte did not exist. The result is a composite, showing the people moving in front of the moving background.

Obviously, these can't be worked with substandard cameras.

The remaining possibility is simple, straightforward split-screen double exposure. In this, a matte is used in the camera (preferably right in front of the aperture) to divide the field. At one take, we make the right-hand side, perhaps; at the second, using a matte

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which is exactly the reverse of the first, we make the rest of the picture. In miniature work, however, we have the problem not only of matting our two exposures accurately, but of getting the people and the miniature to the same relative scale. With a professional camera, we can focus with a frame of test negative of the miniature right in the focusing aperture; but with amateur equipment, the problem is too difficult for anyone but a student of higher mathematics.

Wheels of Industry

Continued from page 218

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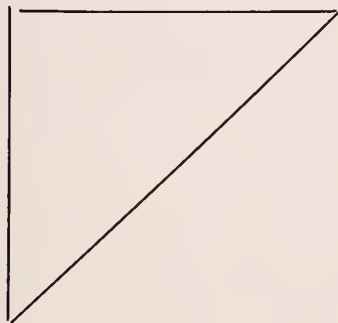
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Volume 17 July, 1936 Number 7

What to Read

LIGHTING REQUIREMENTS of the
Three Color Technicolor Process
By R. E. Farnham.....282

WILL COLOR
Revolutionize Photography?
By Howard C. Brown.....284

SHOOTING UPWARDS from
Fifty Below Zero
By Clyde de Vinna, A.S.C.....286

UNIVERSAL STUDIO to
Emphasize Cinematography
By Charles R. Rogers.....287

DAVID ABEL EVOLVES
New Technique
By Harry Burdick.....288

A.S.C. MEMBERS
on Parade.....290

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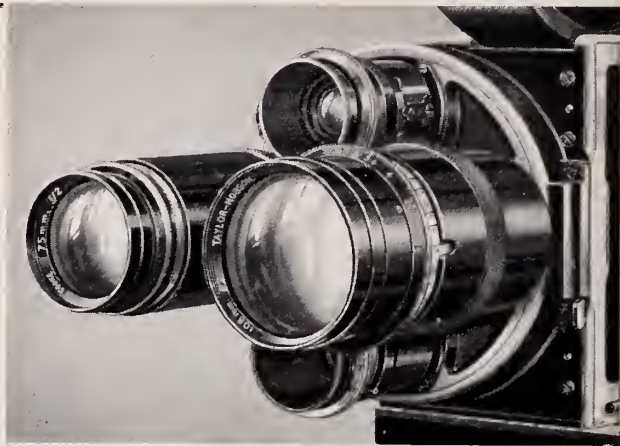
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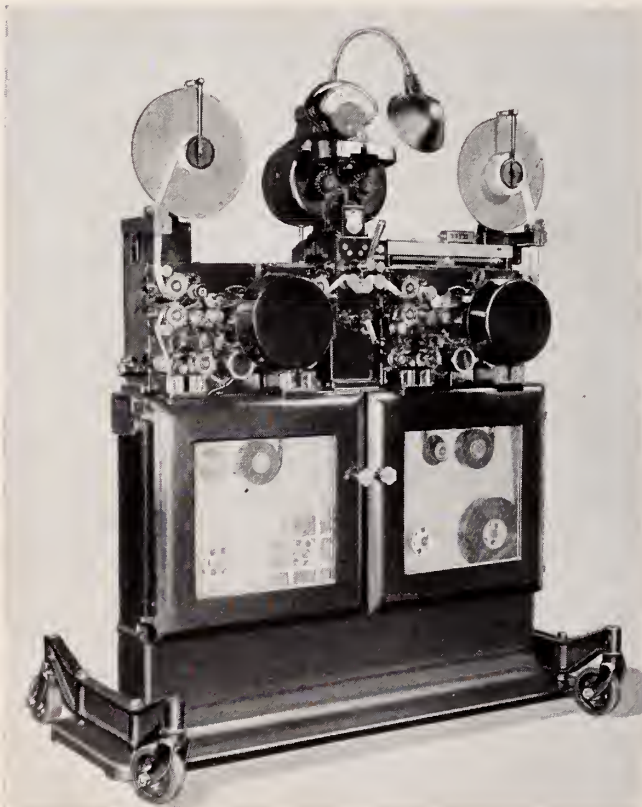
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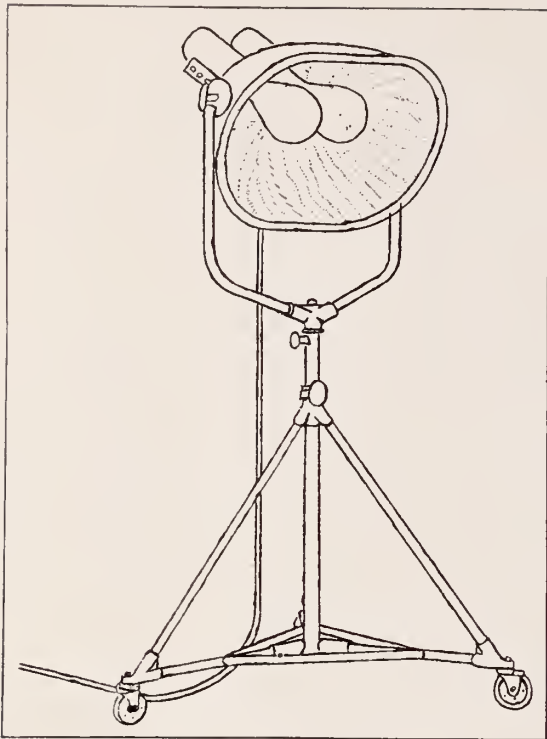
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A recommended design of a compact general lighting unit employing two 2000 watt Moviefloods. These equipments, with associated filters, are fully equal in illuminating power to any other general lighting source of equal wattage.

Editor's Note: This article by Mr. Farnham was prepared by him as a semi-sales argument for Mazda lamps. However, it contains vital information on lighting Technicolor pictures and for that reason we are reprinting the major part of his brochure.

THE TECHNICOLOR FILM, camera, and subsequent processing have been designed for a photographic light having substantially equal quantities of red, green, and blue radiation. This has been done so that pictures can be made with daylight as well as with artificial light and daylight mixed.

Since the color of the white flame arc closely approximates that of daylight, it has sometimes been assumed that this source was essential for Technicolor photography.

The characteristics of the Technicolor process are such as to require approximately two and one-half times the illumination level necessary for black and white photography.

The light emitted by Mazda lamps contains a considerably greater proportion of red-yellow and even of green, than of blue-violet. To attempt to filter out the excess red and green radiation of the usual studio lamps to secure a balance of these three colors would result in excessive losses and unduly high wattages would be necessary. It is a characteristic of the incandescent source that as the efficiency or filament temperature is increased, the amount of blue-violet radiation increases in a much greater ratio than red and yellow, producing a markedly whiter light. Advantage has been taken of this fact by making available the standard group of motion picture studio lamps in a special rating of much higher efficiency and of constant color temperature (3380° K). Even in these high-efficiency lamps, there is still some excess of the warmer colors and a moderate amount of filtering to secure equal quantities of red, green, and blue, is necessary. However, this operation at increased efficiency greatly reduces the filter losses and minimizes the wattage necessary.

The color correcting filter may be placed either at the camera lens or in front of the lighting equipment. The latter arrangement is the one most generally employed for

studio photography because it is thus possible to mix the incandescent light with daylight as a "booster" light, or with the arc. Furthermore, the glass filter incorporates a certain amount of infra-red or heat absorption properties, thus reducing the temperature within the set and contributing greatly to the comfort of the artists.

Suitable filtering material is available either in the form of glass or gelatin. The glass filters have the advantage of a more accurate color correction and absolute permanence of their filtering characteristics. The gelatin (No. 26 Brigham) is much lighter in weight and lower in cost, but fades, and therefore must be renewed rather frequently. The heat absorption properties of the gelatin are practically nil.

The glass employed, both by Corning (Lunar White No. 570) and Libbey-Owens-Ford (Medium Blue), is heat resisting and cover doors can be made of a single piece of glass. This results in lessened liability to breakage as compared with the more usual arrangement of using strips. The Libbey-Owens-Ford material has been further heat treated so as to make it almost unbreakable. However, should it be broken, the entire piece instantly becomes a rock-salt appearing substance and there are no large sharp-edged falling pieces to endanger people below.

These glass filters, either mounted or unmounted, can be rented or purchased from the lighting equipment manufacturers.

In order to produce the higher efficiency and whiter light from the lamps heretofore used for motion picture photog-

Lighting

raphy, it is necessary to operate them at a voltage about ten percent (10%) above their rated volts. Since it is not always practicable to raise the voltage this amount on the sets, the General Electric Company has made available, lamps of 105 volts rating which, when operated on 115 (the generally prevailing voltage on the set) will give the correct color quality after it has been transmitted through filters. These lamps have the same list price as the regular types, and of course are interchangeable with them in the various lighting units.

As mentioned before, the Technicolor process requires at least two and one-half times as much light as the minimum for black and white photography—illumination of the order of 750 footcandles and higher. Good quality in color photography requires that some degree of shadow formation and modeling of the faces be produced by the general lighting equipments as well as the "spots". This effect is difficult of attainment where widespread distribution of large numbers of units prevails, and calls for the more general use of lamps of high wattages, as well as the most efficient types of equipments.

The well-known "rifle" units with the 2000 watt Movie-flood lamp is a very effective unit for general illumination. It can be used from the floor, mounted on the camera dolly, on the parallels, or hung overhead in clusters from suitable suspension arrangements, to provide illumination from overhead.

In certain types of sets there may be insufficient space to place the requisite number of general lighting units ("rifles"). Therefore, a so-called "double rifle" has been developed. This unit employs two of the 2000 watt PS-52 Movie-flood lamps and occupies only slightly more space than the one lamp rifles and about the same as the arc

broad-sides. Its light distribution is somewhat greater horizontally than vertically, providing extremely efficient utilization of light on the set. These units, with associated filter, are fully equal in illuminating power to any other general lighting source of comparable voltage. In some photographic tests on a small set they were immediately dubbed "dynamite". A sketch of the unit appears at the end of this bulletin.

For modeling lighting services, the new Junior Solar Spot employing the 2000 watt G-48 bulb lamp, and the larger Senior Spot unit with its 5000 watt G-64 bulb lamp, are excellent medium-power sources. They are compact and relatively light in weight, and can be put in all manner of places—under tables, behind posts, permitting lighting effects not otherwise obtainable. For beam spreads of less than 12 degrees, the 24 inch Sunspot with the 5 Kw. lamp produces even higher intensities than the Solar Spot of similar wattage.

For the high power spotlighting, there is available the big 36 inch Sunspot with the 10 Kw. G-96 bulb lamp. This unit has already been successfully employed in producing an effect of shafts of sunlight in recent Technicolor productions.

Where it is desirable to reduce the numbers of units and produce still higher levels of illumination, there are available lamps of 30,000 and 50,000 Watts rating. Recent progress in the development of high wattage lamps, such as the use of the bipost construction, and means for the prevention of blackening, make entirely practicable the

Requirements of the Three-Color Technicolor Process

by
R. E. Farnham
General Electric Co.

manufacture of lamps of even higher power. New methods of treating aluminum surfaces have made possible reflectors of almost any size, possessing highly accurate contour and an efficiency of reflection comparable to that of silvered glass. Of greatest importance is the fact that these surfaces are permanent, being very hard, resistant to both abrasion and oxidation. This development makes practicable relatively light weight units for these big lamps.

In order to check the practicability of using Mazda lamps and the several recommended types of filters for Technicolor photography under actual studio conditions, a number of scenes including close ups, medium and long shots, were photographed, in which Mazda lamps were used exclusively. Other scenes were taken in which Mazda lamps were mixed with arcs. The finished picture demonstrated that with incandescent lamps all colors were reproduced with high fidelity, particularly the whites. It is well known that some difficulty has been experienced in securing clear whites when other sources are used. Flesh tones were natural. The results indicated that the incandescent source is also particularly adaptable as a booster light for out-of-doors shots.

Set Temperatures

Owing to the higher lighting intensities required for color motion picture photography, fears have been expressed that the use of Mazda lamps might result in discomfort to the personnel. The lesser amount of the infra-red radiation of the arc, as compared to the better-known types of incandescent lamps, has been cited as a reason for considering this source for high levels of illumination. An analysis is interesting.

The energy entering an incandescent lamp of the usual studio lamp (21.0 Lumens per Watt) is expended as follows:

Heat-Gas Convection	20%
Heat Losses in supports and lead wires.....	5%
Radiant Heat	64%
Light	11%

In the case of lamps of an efficiency of 33.0 Lumens per Watt, as recommended for Technicolor photography, these figures become:

Heat-Gas Convection	20%
Heat Losses in supports and lead wires.....	5%
Radiant Heat	57.3%
Light	17.7%

The heat losses by gas convection and in the lead wires and supports are of no importance since they affect only the lamp bulb and adjacent parts. Of the radiant energy reaching the actors, 85.3% in the case of lamps used for black and white photography, is in the infra-red or heat region. This is reduced to 76.5% for the 33.0 Lumens per Watt lamps—a definite improvement. Both types of glass filters mentioned previously possess some degree of infra-red energy absorption which still further reduces the above percentage.

In a recent paper, published in the Journal of the Society of Motion Picture Engineers, by F. T. Bowditch of the National Carbon Company, entitled "Radiant Energy Delivered on Motion Picture Sets from Carbon Arc Studio Light Sources", the division of energy between photographic and infra-red is given for several types of studio arcs. In general these data show 30-35% photographic energy, 30-35% near infra-red (7000-14000 Å) and 30-35% in the far infra-red (14000-50000 Å) or 60-70% in the entire infra-red zone. Thus, the heat from the high efficiency Mazda lamps is not out of line with that of the arc.

Operating Considerations

In order to derive the full benefit from incandescent lighting and to insure maintenance of correct light quality, lamps should be operated at 115 volts at the socket. It is suggested that a portable voltmeter be made available at the set, and the voltage checked from time to time, particularly with changes in the load. The 5 and 10 Kw. lamps incorporate an abrasive cleaning powder which is effective in maintaining almost initial light output throughout the life of the lamp. It should be someone's responsibility, presumably the gaffer's, to see that these lamps are cleaned at approximately 10-15 hour burning intervals.

Due to their high efficiency of operation, the life of lamps employed for Technicolor photography is necessarily shortened. To conserve their life, it is recommended that they be burned no longer than necessary; as is the case with arc lighting where retrimming is a factor. It might be a very good plan to make available at the set, a lower voltage at which the lamps may be operated for "lining up", general illumination, etc. Then bring them up to full voltage when ready to photograph. Discussion with studio electrical chiefs has brought out that this is frequently feasible, either by providing a lower voltage (say 90 volts) on the duplicate bus at the substation, or assigning one generator to the Technicolor set, and adjusting its voltage upon signal by field control. Experience may very likely

Continued on page 292

IF ONE is to believe half the rumors encountered bath in and out of print today, the title of this article should be not "Is Color to Revolutionize the Industry?", but "When is It Going to Do So?" The release of "Becky Sharp" started everyone to thinking about color; the success of "Trail of the Lonesome Pine" seems to have clinched matters. Sensationalists and conservatives seem equally enthusiastic about the future of color, and many predictions are being made that from one to three years hence, a black-and-white feature will be a novelty.

These againians bring to mind similar statements issued at irregularly recurring intervals as far back as 1861, when Clerk Maxwell, in his classic experiment before London's Royal Institute, laid the foundations of color photography.

Maxwell's experiment was, viewed by today's standard, absurdly simple. He simply made three still photographs of an object—one through a blue filter, one through a green filter, and one through a red filter—and then projected lantern-slide positives of the three one on top of the other, each filtered by its appropriate filter, and re-created the original colors of the object. Crude as the experiment was, it was hailed as marking a new era in the history of photography.

I suppose that the first time these phrases were used in connection with motion picture color was back in the late 1890's, when Robert Paul exhibited a seven-reel production of "The Miracle", hand-colored in every one of its 112,000 frames.

The truly photographic color processes didn't get any widespread praise until Kinemacolor, in 1912, startled the world with flickery, two-color additive scenes of the Coronation of George V and the Durbar. Then the epoch-hailers made up for last time.

Again, between 1920-22, Prizma, with a two-color subtractive system again set the Industry's tongues wagging. This culminated in Cammaddock Blackton's English-made "The Glorious Adventure", which was released late in 1922.

In January, 1923, the first really commercial color feature, "The Toll of the Sea," was released by Metro-Goldwyn-Mayer. It marked the debut of the Technicolor process. Originally, this had been an additive process calling for a great deal of special projection equipment; but in its subtractive version, Technicolor gave the critics of that day something really worth praising.

In 1924, a Paramount unit took the daring step of making an outdoor picture in color; "The Wanderer of the Wasteland" (story by Zane Grey, color by Technicolor) started another journalistic rush to the color bandwagon. But the producers somehow didn't join the rush.

Again, about two years later, Douglas Fairbanks, after many conferences and special price arrangements, made "The Black Pirate" in Technicolor. Fairbanks used really excellent taste in his handling of color, and the production not only drew critical raves, but stood for many years as color's crowning achievement.

It was not until 1928 that color made a really substantial entry into the picture business—and then it was not because the industry really wanted color.

Warner Brothers had made a clean-up by introducing sound, and someone sold them the idea that a new gold-rush could be started by beating the field with the first all-color-all-talking feature. As a result, Warner Brothers—and nearly every other producing company—went headlong into color and contracted for millions of feet of Technicolor, not only for the current season's programme, but far years in advance.

The years 1928 and 1929 saw many features made in color. There is little need to talk about them, for probably half the members of the A.S.C. had the misfortune to

contact color during those frenzied days. It is said that 77,000,000 feet of color went through the Technicolor plants alone, sadly overstraining their limited capacity. So great was the rush to get out color prints that many unbelievably bad ones found their way into circulation, and the color-bloom died a-borning, to remain unburied until Technicolor's three-color process and Disney's "Three Little Pigs" started the revival which today has every major producer of Hollywood and England either begging for Technicolor cameras—or wandering where he can get himself a substitute.

There is a very definite reason for these more recent color cycles since "The Toll of the Sea". In the early days, color's negative cost was about seven times that of black-and-white. A tremendous amount of lighting equipment was required. Release-prints cost about twenty cents a foot—and were not readily available, even at that price. So far years a color picture was a luxury, and only an occasional producer could afford one.

By 1928, slim business and technical improvements had combined to make color more economical. Photography had been improved to a point where a color unit could keep within shouting distance of a black-and-white troupe's efficiency. Technicolor had developed its imbibition process of printing, and release-print prices dropped to

Will Color

about ten cents a foot. The Industry had plenty of money to burn, and color looked like a profitable way to spend it.

Then came the depression. The producers began to curtail expenses, and the first thing to feel the knife was the luxury of color. The producers asked for cancellation of their color-contracts; next they tried to postpone indefinitely the starting of pictures which their contracts forced them to make. (It is reported that more than a few of today's projected color-specials are being made under extensions or revisions of these same 1928 contracts.)

The producers also began to realize that in pushing the cause of color they had been building up an industry in which they had no direct interest or control. The color-product of every studio in the Industry had to pass through the "bottle-neck" of a single centralized color-plant which was utterly beyond the control of even the most powerful studio-head. This possibility of monopolistic control hastened the trend away from color. Everyone kept away from color as they would from a plague.

In time, the depression had a two-fold result. At first, it was in order to reduce production expenses that color was dropped. But as the depression bit deeper, executives began to wonder if the novelty of color might not draw the people back into the theatres.

Today, the success of "Trail of the Lonesome Pine", which is ringing up astonishing grosses everywhere, is jolting the industry into a new awareness of color.

Furthermore, with the ever-present threat of commercial television, color seems an excellent ace in the hole, for no matter how soon television may come, it is certain that it will be many, many years before pictures can be televised in color.

What have we, then, available to fill this growing demand for color?

Speaking for the major studios, there seem to be but two immediate possibilities. The major studios, in the first place, demands first-class color rendition, which presup-

poses a full three-color process. Economy, ease of operation, and freedom from the domination of a centralized laboratory are also important, but quality results are the heart of the problem.

The Industry's Number One color process is undoubtedly the new three-color Technicolor. This is backed by an organization which for fourteen years has been awaiting just this opportunity. Its results have been shown commercially in three features, many shorts, and several score Disney and Harmon-Ising cartoons. The firm has a number of processing laboratories in operation, another building in England, and has just authorized the expenditure of \$1,500,000 for further expansion.

On the other side of Technicolor's ledger must be entered the items of expense and the old bugaboo of a centralized laboratory. Authentic figures as to cost are not at present available, but in an article published rather recently, and apparently with Technicolor's official blessing, it was stated that the added photographic cost for Technicolor over black-and-white for a feature production was approximately \$85,000, with probably another \$50,000 added to cover the items of slower production, increased electrical consumption, etc., giving a total of about \$135,000 more than black-and-white. At present, limited laboratory and equipment facilities are available, and there are

Revolutionize Photography?

by

Howard C. Brown

only a few trained Technicolor Cinematographers in the world. All of these latter factors are, however, remediable; and the process has proven that in competent hands it gives superb results.

Technicolor's only possible competitor, at this writing, is the Keller-Dorian process. This process is of the additive type, requiring a special filter on the standard camera and projector. For several years it has been under intensive development by the Keller-Dorian and Eastman Kodak researchers; indeed, it is known in some quarters as "Eastmancolor". For the past year or more, the process has been readying for commercial use at the Paramount Studio, under a special, non-exclusive contract; it is understood that it will be generally available to the Industry. The results have not, as yet, been shown commercially, though reports of private showings, and samples which the writer has seen, indicate that it is an excellent, three-color process. The cost, according to recently published and authoritative articles, seems remarkably low. An average feature colored by this method would, it is claimed, cost about \$30,000 more than black-and-white. Standard black-and-white cameras and lighting are used, and any black-and-white laboratory can handle the color-processing with only minor alterations. Its commercial debut should prove a significant step in the history of color.

In addition to the three-color processes mentioned, there are a number of good two-color processes available. Several of these were introduced shortly before the appearance of Technicolor's three-color system, and are greatly in advance of earlier two-tone methods.

The largest of these plants—second as a color laboratory only to Technicolor's establishment—is Cinecolor.

This is a bipack process, which permits the use of standard cameras and lighting, and offers excellent two-color results at a cost not greatly in excess of monochrome. Cinecolor develops its own negatives and makes prints on double-coated positive film. As a result of many months of experimentation with dyes, Cinecolor is able to obtain very excellent results. When the firm's new plant is opened, they will be in a position to turn out single-coated prints in both two-color and three-color, and should become an increasingly important factor in the color field.

Consolidated Film Industry's Magnacolor, Dunning's Dunningcolor, and Vericolor are also contenders in the two-color bipack race, and turning out excellent two-color pictures. George Hirliman's Hirlacolor is understood to be an adaptation of the Magnacolor bipack principles.

Several firms and individuals have lately experimented with two-color processes in an attempt to remedy the impaired focus of the rear bipack negative. Dunning-Harrison and Gilmore have both used beam-splitting devices which gave two reduced-size frames on a single film at a single aperture; another experimenter, — Jones, has used a prismatic beam-splitter to separate the image into two full-sized ones, recorded on the two films at two apertures mounted at right angles.

Considering the foreign field, we find the foreign producer greatly hampered. Most of the processes abroad are either experimental or conversational. In England, while the demand for color is greatly in excess of that here, the British producer must rely upon American processes for immediate results. Technicolor is of course erecting a plant near London, and it is understood that the George Humphries' Laboratory is a Dunning (bipack) licensee. The most important domestic process being used in England is the Friese-Greene process, an additive one controlled by British International Pictures. A new bipack process known as Harmonicolour has recently been introduced, but according to information so far obtainable, this process has an unusually restricted range of color value, and the prints lack considerably in definition. The Gasparcolour process has had some publicity, but according to the meagre information sandwiched between the adjectives, it appears to be essentially a printing process which leaves the problem of producing the negatives up to the customer's ingenuity. Three other processes are being exploited: Raycolour, a two-color additive process; Ondia, a two-color chemical process; and Dufaycolour, a mosaic-screen three-color process familiar to Leica users. The American inventor, Percy D. Brewster, who as early as 1931 produced a one-reel short in his subtractive three-color process, recently sailed to open a color laboratory for Revelation films at Wembley, England.

France, Germany, and a few other continental nations have minor color activities; principally in bipack. Their product, judging by trade-paper foreign reviews, is somewhat inferior.

The only color firm to have expanded toward the Orient thus far is Cinecolor, with a licensee understood to be in operation in the Philippines, and another plant being installed in Bombay, India.

Soviet Russia is understood to be conducting some experiments in color filming, but no authentic reports have as yet reached us as to the progress made by the Russian colorists.

But with the many color processes actively available here and in England, it seems as though color had at last really arrived. Both major and independent producers are announcing imposing lists of color productions for the current season; Technicolor's plant alone has announced that it will process, for this country alone, not less than 19 fea-

(Continued on page 294)

Shooting Upwards from Fifty Below Zero

by
Clyde de Vinna, A.S.C.

ALL OF US, I imagine, have at one time or another been party to unexpected outbursts in projection rooms when rushes have been screened for critical appraisal. Here's one that should come close to topping the list.

We were filming "Trader Horn" in Africa. Our laboratory and general field base was in the pleasant community of Nairobi. Some four miles distant, in a clearing adjacent to desirable locations was our camp. We had portable electrical equipment, projector and screen. In the balmy cool of early evening, the screen would be suspended from nearby trees and we had a perfect air-conditioned projection room.

In due course, our first rushes came through and all hands gathered about to inspect them. Word of the impending event had spread among the natives and there must have been several hundred of them lurking in the deepening shadows back of us. The screen came to life and we settled back, intently studying our work. As the imaged action became more tense, there came an amused titter from the horde of uninvited guests who were viewing their first movie.

The murmuring wave of subdued chuckles broke into a roar of uproarious guffaws. The jungle reverberated with these howls of unrestrained merriment. The natives had never seen anything so funny in all their lives. The scene would have gladdened the heart of any comedy director.

One venturesome G-stringed buck gave vent to his in-born curiosity and stood on his head to see what the pictures looked like upside down. The results apparently more than justified his anticipations, for he screamed peals of laughter that rang out above the others.

His playmates noted the extra enjoyment that came from his inverted posture and emulated his reverse stance. Their laughter became thunderous. Majestic lions pinned back their ears and sulked deeper into the jungle. Maternal elephants trumpeted their offspring into sheltered retreats. So I am told.

We took our attention from the film and gave eye to our volunteer and responsive audience. What we saw must be one of the most amazing sights of record—two or three hundred natives in an African wilderness, standing on their heads and bellowing with glee. When they could stand it no longer, they toppled over and writhed on the ground in merriment holding their convulsing sides, but yowling their joy. As the old vaudevillians used to say, we surely stood the customers on their heads and laid them in the aisles. Literally.

Radio, also, was new to these dark-skinned boys. They listened to our set the evening it was first hooked up. Next morning I intercepted a party of them armed with shovels. They wanted to dig up and see what kind of a strange wire was used to bring in so unusual sounds. These white men and their quaint contrivances!

Africa is far from being the dank, dark jungle wilderness of sweltering heat that much of the public fancies. There is snow in Africa—year round. And on the equator! Mount Kenya in British East Africa never loses its snow-capped peaks. It's smack on the equator.

But there are more problems photographically in the far North than in the tropics. "Eskimo" was probably the most difficult cinematographic enterprise I have undertaken in all my years of making films in far-off places. We went to Alaska and north from Nome. The temperature was around fifty below—on warm days. It's a

bleak, barren, desolate area of ice. Topography is not unlike a monotonous flat plains country. A grey haze settles about the terrain. There is no sky for the fog. Or, in summer months of long days, you get an intense baffling light of tremendous brilliance. Eyes must be shielded from its blinding glare.

Storms break almost without warning. You suddenly find yourself surrounded by a raging blizzard of dense fine snow driven before the wind. Vision extends a few feet. It is out of the question to photograph such a storm of the north expanses. If you try it your negative will look like nothing at all.

Under the low temperature, film gets brittle and will snap apart at very annoying times. All moving camera parts were made entirely dry and clean of lubricating oil, then given a sparse application of sperm oil.

So far as the effects of extreme minus-zero temperature on equipment and film was concerned, this was thoroughly established at the studio prior to our departure. Under the direction of John Arnold, chief executive of Metro-Goldwyn-Mayer's camera department, a huge "cold

Continued on page 291

Clyde de Vinna, A.S.C.



APPRECIATING keenly the top-bracket importance of correct cinematography in current motion picture making, one of the first orders issued when I took over the duties as executive vice-president in charge of production at the reorganized Universal studio was the strict mandate "improve photography!"

Steps immediately were launched to bring our forces of equipment and man-power up to high standard. Camera equipment was revamped and brought up to the minute. Lighting facilities were augmented by installation of prevailing units of latest type. Laboratory procedure was perfected to current levels. Work of first water does not come from tools of secondary grade.

I determined to make Universal an opportunity studio for ranking cinematographers, an incentive and challenge to their finest creative talents. There is nothing altruistic about this. It is sound business, and my reasons are logical and simply set forth.

Motion picture theater audiences judge a picture from the first second it flashes on the screen. If introductory titles and the first few scenes are beautifully and effectively photographed and reveal the mood of the story, then the audience immediately relaxes and its enjoyment and appreciation of the film are certain.

If the photography is off key, or lacks quality, the picture gets away to the handicap of indifferent audience regard.

I want and shall insist that every Universal picture have every possible advantage from script to theater. I want



Charles R. Rogers, Executive Vice-President,
Universal Studios

Universal Studio to Emphasize Cinematography

fine artistic settings and composition. I want able actors and proper wardrobe. And I am placing every available emphasis on the best photographic achievements to make each frame of a production a beautiful, enjoyable and impressive picture.

To me this seems the very foundation of the picture business. An actor may have a good voice or a poor voice; the recording may be poor; the theater's sound projection unsatisfactory. But if the pictured images on the screen aren't a delight to the eye the picture hasn't a chance in the world of succeeding.

We pride ourselves on excellent recording at Universal. But fine pictorial values are even more essential to screen fortune than fine sound. The art of correct cinematography is one of the greatest miracles of motion pictures.

At Universal we appreciate the artistry of photography and respect the cinematographer as an artist. We are trying to give him every encouragement in obtaining not only photographic quality but also artistic advancement.

To this end, we recently gave a term contract to Hal Mohr, A.S.C., as Director of Photography and as a Director. We gave Mohr this two-way contract to encourage the cinematographic profession to think in terms of production as well as photography. There may be other such contracts in months to come.

We feel that after serving years behind the camera recording dramatic action, the cinematographer should be able to extend his artistry to the direction of players with more feeling, more intimacy, more realism, and a deeper grasp of the immediate problems at hand, than the over-age director lacking such vital experience.

It should be a matter of direct interest to cinematographers in general to watch the progress Mohr makes in

his first directorial assignment. He is entirely sensitive to this obligation and will not embark on this new phase of his career until the right vehicle appears.

Meanwhile, he has given our photography an obvious "lift", as have Merritt Gerstad, Milton Krasner, Joseph Volentine and Norbert Brodine, all A.S.C. veterans. These men are close students of their craft, they are experimenting and progressing, they study actors and their moods. They are called into consultation in preparation of scripts, and together with directors and scenarists evolve new means to keep dialog pictures active and moving; to eliminate the boring speeches and to select camera perspectives that present the subject in novel but natural and in-key fashion.

Recently we prepared a three-reel picture presenting our new players to our sales convention and later sent the reels to all of our branches throughout the world. Thanks to our new photographic regime, we learned more about

Continued on page 294

by
Charles R. Rogers



DAVID ABEL, A.S.C.

sheer beauty of his dance, why should he not hold similar interest for a screen audience for a similar uninterrupted period? Why should his artistic offering be carved and served in slices, merely to conform to a general studio practice?

So Abel hit upon the daring but simple solution of filming the entire dance from start to finish and screening it without mechanical interference. In fine, carry the natural beauty, grace and rhythmic flow of physical movement to the screen in complete and unadulterated value. The visual action of the dance would be too vivid for the scene to harbor on static.

As result, Abel takes scenes running up to five hundred feet as screened and no onlooker has yet been known to lose interest.

Lensing of the intricate dance numbers, in solo or with partner, presents specialized problems. How thoroughly Abel has them in control is evidenced by the box-office lure of the exhibited productions.

Astaire develops his dance creation as his imagery dictates. Abel offers no restrictions. Astaire can dance from one end of the stage to the other if he so desires. The star thus has fullest range of artistic expression.

With the dance well rehearsed, Astaire comes to the set for final polishing and timing. This is when Abel goes to work.

Experience reveals it far more satisfactory to have the music in form of a previously recorded playback. This one factor, at least, is stable.

As Astaire runs through his routine, Abel levels his

David Abel Evolves New Technique

by
Harry Burdick

FROM THE DAY that microphones became an item of standard studio equipment, proper photography of dancing has presented perplexing problems. True, there has been no scarcity of productions of the song-and-dance variety. But in these, the dance element has consisted largely of animated costumes of increasing magnificence gyrating in sundry geometric patterns and pedaled by elementary examples of footwork. Fast transitory cuts embracing effective camera angles furnish eye-filling pageants.

It remained for David Abel, A.S.C., cinematographically to convey to the screen the full flow of poetry expressed by this art form. And in so doing, he photographically pinnacled the great stage dancing star, Fred Astaire, to similar heights of screen popularity.

It is to be expected that he would emerge victorious from this camera conundrum. For Abel is an active member with distinguished record of those hardy pioneers who ministered to the photographic development of the motion picture through its pre-adolescent years of two decades back. He is one of the scant dozen who have survived the increasing demands of the growing technical art over the years to hold high office in the face of today's cinematographic conditions. These seasoned seniors tackle tough jobs with all the calm confidence that is acquired only from long campaigning.

Awarded the first Astaire assignment on "The Gay Divorcee," Abel applied a full measure of cold analysis to the task ahead. If, he reasoned, Astaire could hold a stage audience entranced for three to five minutes by the

camera on him. In rare instances two or three cameras have been used to offer selection for most effective angles. Mainly, the lens represents a normal point of view, as of an audience witnessing a stage performance. First is noted the area covered by the dance. This varies and may be limited or extensive. Abel now proceeds to bathe this entire area with light. There can be no individual lighting for the star covers too much territory during the scene. This lighting must be absolutely uniform, minus all shadows or luminous spots. It is brilliant as to mood but in key with scenes, preceding and following, which are toned from the dance scene as a base.

Full figure shots are taken, in parlance 'long shots.' There are no cut-in close-ups. Hence the lighting must so be deployed as to cover every gesture, every fleeting expression. They might be termed, for lighting estimation, close-ups of full figures.

Continued on page 293

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A.S.C. MEMBERS

ON PARADE

● **Theodore S. Aprakhul, A.S.C.**, has joined the nation's radio favorites. Appearing as special guest artist on the Jack Benny program on Sunday night, June 21. Theodore is receiving various and sundry mail from the crooner fans. Ted is practicing the scales in his bathtub. Thus the airlines are trying to lure another of our Hollywood famous.

● **John Arnold, A.S.C.** and **George Folsy, A.S.C.**, upheld the prestige of the Directors of Photography in the M.G.M. golf tournament Sunday, June 21st by shooting a twin 71. We do not mean a 142. Two men played one ball. (They had a handicap of 18, thank goodness.)

● **Harry Perry, A.S.C.** post cards us that he likes Hollywood better than Vienna, where he is now shooting backgrounds for Galdwyn's production, "Dodsworth". Possibly it's the language that's confusing Harry.

● **Glenn McWilliams, A.S.C.** is now shooting the "Great Barrier" for Gaumont-British in England.

● **Narbert Brodine, A.S.C.** staged a barbecue breakfast on father's day in honor of himself.

● **George Barnes, A.S.C.**, another of Hollywood's bright lights is being tempted by the radio. A week or so ago George appeared on the Lux hour with Cecil B. DeMille. What's this radio going to do to us; the roll call will soon sound like the A.S.C. roster.

● **Kard Freund, A.S.C.** and **Victor Milner, A.S.C.** are both working on pictures that have a Chinese story. Freund on "Good Earth", out at Metro, and Milner in "The General Dies at Dawn", at Paramount. Both of them are going into such things as the Ming Dynasty and other such highbrow topics. Now and then they quote a bit from Confucius.

● Did you note in the late issue of the Saturday Evening Post in the story by an agent that he admits the big stars insist on naming their own cameramen, realizing that the stars are made or broke in the camera . . . a bit of good common sense, says we.

● **Wm. Daniels, A.S.C.** was tempted a short time ago by the radio, but his better sense prevailed. He is back on the cameras. He appeared with Wallace Beery on the Shell Hour.

● **Wm. O'Connell, A.S.C.** is not at 20th Century-Fox as we reported last month, but with Warner Brothers. It just goes to show how hard it is to keep up with fellows

like Bill, just bustling around from one studio to another. He was at Fox for about five years and now we suppose in about another four or five years he will get restless and go to some other studio . . . yea, it's a hard job keeping up with fellows like Bill.

● **Hal Mahr, A.S.C.** has returned from Pittsburgh, where he went to secure background shots of the steel mills and other phases of the iron industry. Immediately upon his return his doctor ordered him to take a vacation.

● **Farcot Edouart, A.S.C.** is vacationing somewhere in Yosemite in an effort to forget transparency shots. You'll find him under waterfall No. 73.

● **Phil Chancellor, A.S.C.** just received an associate membership in the Royal Photographic Society of England. It's now Philip Chancellor, A.S.C., A.R.P.S. and F.R.G.S., more initials than the administration, and he isn't a Democrat.

● **Sol Polito, A.S.C.** is now doubling in brass . . . he is endeavoring to become a member of the 4th estate. Recently he doubled for Robbins Coans, feature writer of the Hollywood Citizen-News and while Robbins was on his vacation conducted his column for one day . . . of course he talked about photography.

● **Harry Fischbeck, A.S.C.** was proposed for mayor of Palm Springs, but Harry rushed back to the Paramount Studios and hid in his blimp until after election. The whole matter was seemingly provoked because Mrs. Fishbeck went for real estate owning at the Springs. Harry claims he can never be anything but a cinematographer . . . but can you imagine his cards reading, "Hizzoner, Harry Fishbeck".

● **Henry Sharp, A.S.C.** is directing photography at Paramount on "Lady Be Careful". Frank Dugas is his assistant. There is a form of sea-sickness prevalent on the set . . . due 'tis said to Dugas' pipe.

● **Chas. Lang, A.S.C.** is still sunburning the roof of his mouth and his tansils looking at the tall buildings on his vacash in New York City. It's Charlie's first migration from Sunny California.

● **Elmer Dyer, A.S.C.** isn't sure whether he is going to Mexico or Arizona for exterior shots of "The Light Brigade". The studio rumor is Mexico, but Elmer's assistant said he heard from the man at the zoo who heard from the man who owns the horses that everybody is going to Arizona. So if you are doubtful about where you are going on location after this the best bet is to ask some horse on the lot . . . they'll know more about it than the producer himself.

Shooting Upwards from Fifty Below Zero

Continued from page 286

room" was erected. In it we could develop temperature as low as seventy degrees below zero.

Here we made elaborate tests. I may add that I, too, got a bit of testing in that room. Possibly of the most interest is the test we made to reveal the effect, if any, of extreme cold on the photographic qualities of film. Under identical conditions and on the same reel of negative, footage was exposed at seventy degrees below zero and then at regular steps up the temperature to normal room warmth. No appreciable difference could be observed over this wide temperature range.

In fact, from Alaska to Africa or Indo-China or Tahiti I have found that our current film is remarkably stable in regard to sensitiveness to light of the silver salts in the emulsion, over a wide range of working temperature and atmospheric conditions.

"Eskimo" was the first picture I had photographed without a field laboratory at hand for immediate negative development. As a result, I am firmly convinced to the the policy of on-the-ground processing when on extended far-

off locations. It is far more satisfactory in all ways, and safer.

Our undeveloped negative was flown out of Alaska to Hollywood twice weekly. It all came through satisfactorily with the exception of one reel. That one apparently had become heated in transit, had sweated, and become chilled again. When opened at the studio laboratory, the negative was firmly stuck together and only by extremely careful treatment was it made usable.

Generally speaking, there are far more photographic possibilities resident in the tropics than in Arctic regions. You can find plenty to shoot. Shadows may be bothersome due to the atmosphere being so clear and lacking reflecting qualities. There is much variance in climatic conditions day to day and from one set-up to another. Only one factor is certain, the uncertainty of light values.

The secret of bringing back good pictures from lands of extreme temperature is, as in the studio, to plan your work, do it carefully and intelligently, and with great patience. You must be

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willing and content to wait for suitable conditions. We waited six weeks in order to get one needed shot for "Eskimo." But it was right when we did get it.

My many years of nomadic camera work in distant corners of several continents—filming dramatic productions, mind you, not scenics—have not been without manifold compensation. I feel I have obtained more from my efforts than had I been engaged in routine studio duties. Certainly my experiences have been more unusual, life more full. There has been no monotony. Each morning has brought, not merely "another day," but its quotas of new problems. There has been little of the cut-and-dried nor the easily-anticipated. I have acquired a broad sense and appreciation of reality—which is good for the soul.

I believe these experiences make me a better studio cinematographer. Certainly I have fallen into no grooved formulaistic way of working. I don't pattern my practice after prevailing accepted versions. Friendly critics give me credit for imparting a feeling of vigor and body to man-made scenes. I hope they are correct.

As you read this I will be at Santa Cruz filming "Ol' Hutch". It's the farthest I have been from Hollywood in six months. I'm afraid I'm beginning to take root in the place.

Lighting Requirements of the Three-Color Technicolor Process

Continued from page 283

show that the useful life of lamps conserved in this manner will be about the same as the present regular studio types.

All sizes of Mazda lamps used for studio service change their light output the same percentage for a given change in voltage, so that contrasts and balances between shadows and highlights, set up at a lower voltage, will be faithfully retained when the lamps are brought up to full voltage. The entire group of lamps recommended for Technicolor photography possess the same color quality of light, and furthermore, this color remains constant so long as the voltage does not change. This feature is of particular value in close-up work where relatively few lamps are used and the "averaging" effect of large numbers of sources is not present.

Incandescent lamps have been used exclusively for several years in making the popular animated cartoons in Technicolor, and have frequently been used for special effect shots and process work in current productions.

The many inherent advantages of incandescent lamps to the studios, which experience with black and white photography has so thoroughly demonstrated, demands their more extensive use in forthcoming Technicolor productions.

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David Abel Evolves New Technique

Continued from page 288

Camera is mounted on crane or ambulator as conditions dictate. As Astaire does his dance maneuvers, so does Abel rehearse his camera crew. So far as possible, the camera follows the star framing him head and foot. As rehearsals proceed, the crew learn the song music and take words from the lyrics as cues to the star's immediate destination. In this way, they can anticipate camera mobility.

The Operative Cinematographer, eye glued to view-finder, keeps the star in frame with thought for correct composition. The Assistant is alert for changing focus. Others man the crane or ambulator.

To make things more interesting, Astaire purposely concentrates on his work at hand and gives no thought to his position at any time in relation to the camera. As result, he seldom covers the exact route twice. Which forbids any precise advance calculations by the cinematographic staff.

When Astaire is satisfied as to the perfection of his effort, Abel is ready for the 'take.' Then, as he puts it, "When the camera starts, it's every man for himself." As an instance of co-ordinated team-work, it is a superb sight.

A modly whirling, dancing photographic toget, with Abel lighting and lensing it with all the uniformity of a stationary subject! Even so, a minute slip in the timing of the camera's manipulation and all-important flying feet are cut off, or vital expressions go out of sharp focus.

It is a formidable undertaking. It calls for fathomless alertness, patience, perseverance. No tricks are used. What Astaire does on the screen, he does before Abel's camera—and Abel captures it.

For notable instance of camera agility and of close-up lighting of full figures operating over a wide area, you can well observe Abel's current contribution tentatively titled "Never Gonna Dance." It is truly amazing what flexibility can be imparted a camera under competent hands.

David Abel's long cinematographic career serves him well in these trying assignments. It has permitted him to contribute a new technique of photographing the dance. In so doing, he has still farther extended the ever-widening horizon of the camera's capabilities. The camera has met and conquered yet another form of creative expression that had origin on the stage.

Behind him are a long line of strict-

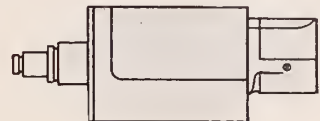
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ly dramatic compositions. His accomplishments in celluloiding the dance open vistas of still greater artistic and technical victories. His genius has permitted untold millions to enjoy in undiluted form the beauty of personalized rhythm. He gives to the screen that which was heretofore the sole property of the theatre.

Universal Studio to Emphasize Cinematography

Continued from page 287

these young players in a half-hour than we could in two months otherwise.

Close-ups were made things of beauty, and being beautiful the best camera angles of the players were italicized. The big "choker" type of head shots not only aided the young players to make good impressions but they also showed our studio folk how slight changes in hairdress, a bit of dental work here and a cosmetic change there, would enhance their value as purveyors of screen entertainment.

I am happy to note that progressive film critics in many important cities are now crediting the photography in pictures to the individual cinematographer because the sheer merit of the pictorial creations has demanded recognition to the man behind the camera as well as those in front of it.

Full public as well as professional recognition is bound to come to all these fine artists of the camera, and we sincerely and earnestly hope that at Universal in the next year we will be able to lead in the field of photography as well as in general entertainment value.

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Will Color Revolutionize Photography?

Continued from page 285

ures and 100 shorts, in addition to serving the English producers until the British Technicolor branch is in operation. Such volume, alone, cannot make a lasting color boom; but the intelligent way in which producers, directors and cinematographers alike are approaching the problem of color is the real augury of color's success. Once we have genuine entertainment in color, as distinct from the too often undistinguishable "pictures in color" of the past, color will find itself permanently entrenched in both studio and box-office.

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AMATEUR MOVIES

JULY,
1936

this issue

How to Find Lens Field
What to Shoot at the Centennial
Notes on Nautical Filming
Do Your Cutting in the Camera
What to Shoot in Color
... and other features

25c



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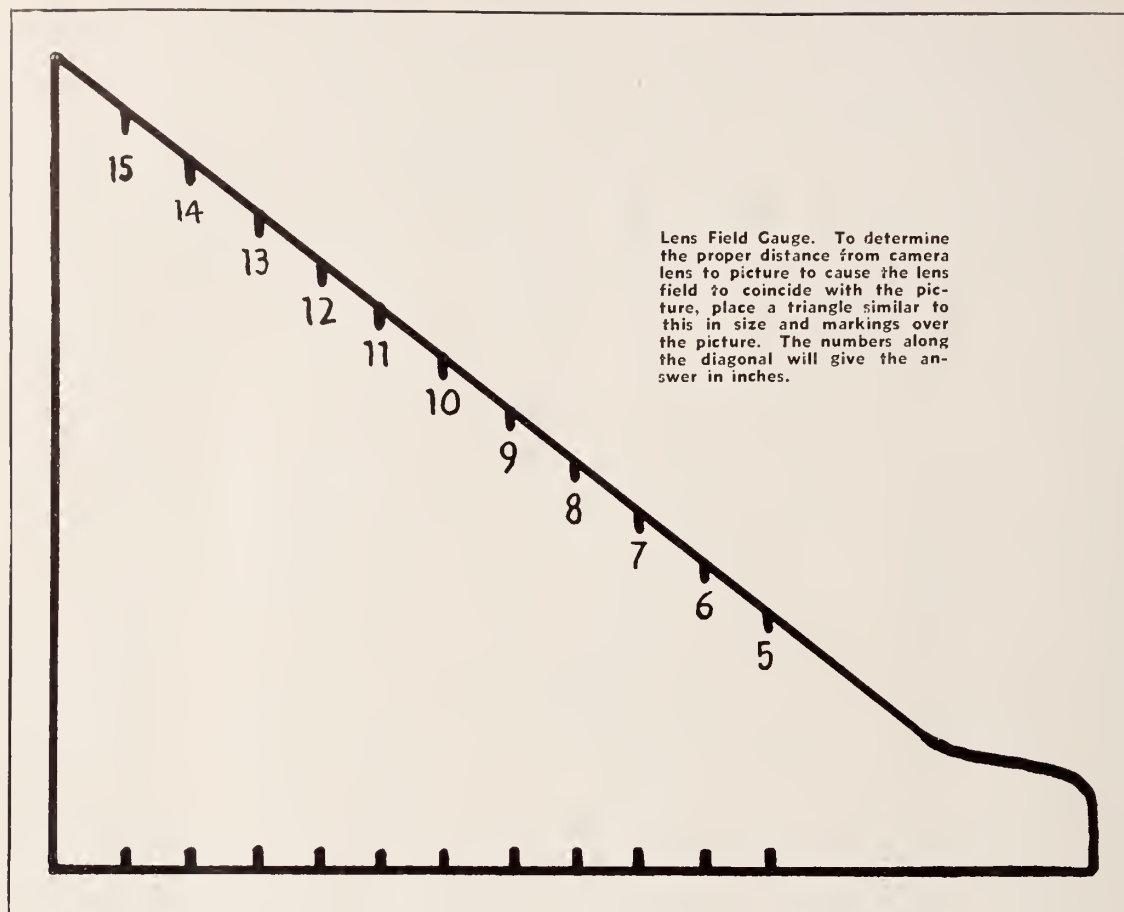
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David Abel, A.S.C., Director of Photography of Fred Astaire Productions, R.K.O. Studios

Contents . . .

HOW TO FIND Lens Field for Inserts By B. S. Mothershead.....	300
WHAT TO SHOOT at Texas Centennial By Wm. J. Grace.....	302
IF STORY IS NOT the Thing, What Is? By Mox Liszt.....	303
NOTES ON Nautical Filming By Carl A. Stahl.....	304
DO YOUR CUTTING Right in the Camera By Walter Blanchard.....	305
SELECTIONS IN COLOR By Wallace Black.....	306
ALL OF THE FAMILY Is in This Scenorio By Barry Staley.....	307
WHEELS OF INDUSTRY.....	308
HERE'S HOW By A.S.C. Members.....	310



How to Find Lens Field for Inserts

by
B. S. Mothershead

WITH FEW EXCEPTIONS, every amateur cinematographer has been more or less interested in still photography before he took up the kinetic art. And the chances are that he has quite a collection of "snap shots", which he values for their artistic quality, or perhaps for the drama or comedy captured, or at least because they bring back pleasant memories of events and folk.

But with the acquisition of his cine-camera and projector, the still photos are pushed to the back of his bureau drawer and almost out of his memory. And so all of the good and pleasant qualities of those photos are lost to sight. It need not be so. It is quite practical and the results may be highly gratifying when the best of these still photographs are blended into the reels of moving images.

There are many ways in which this blending can be done without sacrifice of the artistic effect or lack of continuity. Perhaps the most obvious application is the preparation of a special reel with the primary purpose of presenting these photos. A photo album is the center of interest, and the action revolves around it.

Perhaps it will be the mother pointing out to little Johnny how daddy looked before he married her. Or it may be daddy taking the young son through a series of adventures partly remembered and partly imagined, but in-

spired by those photos of the hunting or fishing trip. Perhaps a group of old friends may be brought together and turned loose on a lot of photos in which they have a common interest. If the cameraman is alert he is sure to catch a wide variety of emotions as the pages of the album are turned.

Some such idea will furnish the continuity or moving background for your still photographs. The reel should open with enough action to clearly present the idea and prepare the cinema viewer for the reception of a still photo on the screen. Then a section of film showing the still is cut in. A little action follows to show the reaction of the person looking at the album. Then another still, and so on. Avoid monotony that will result from either too much switching back and forth from action to stills, or from too many stills in sequence without a little action

to maintain the continuity. Also avoid holding a single still on the screen too long. Five to eight seconds is long enough unless there is some particular reason for holding it longer. Also avoid the use of stills that portray arrested motion unless you want a comedy effect.

The matter of transferring your still photos to the film to be spliced into your reel is not difficult, if you have had any experience in making your own titles. Of course, if you cannot be bothered with that sort of thing, just send the selected photos to some good titling studio, and they will be returned with the film reproduction ready to be spliced into your reel.

If you wish to do your own reproducing, refer to articles heretofore published on titling methods, and follow the suggestions there for centering, exposure, et cetera. There are two points on which special suggestions should be made here, growing out of the fact that you must take the photos as they came with regard to size, while you can control the size of your title copy.

The first point is in adjusting the distance of the camera from the picture so as to have the full field of the camera filled by the picture or such part of it as is desired. I have found the quickest and most satisfactory way is in the use of a piece of cardboard cut to the approximate shape of a triangle with graduations marked on it so that it may be placed over the picture to be reproduced and a direct reading taken of the required distance. A diagram of such a triangle prepared for use with my camera is presented on this page. A similar triangle can be made for any other camera, by taking a few test shots of this triangle with the other camera, and increasing or decreasing the spaces between the graduations marked.

To use the triangle, place the right hand corner at the lower right corner of the picture. Align the lower edge of the triangle with the lower edge of the picture. The upper left corner of the picture or its top or left edge will cross the diagonal edge of the triangle. The mark on the triangle at the point of such coincidence will indicate the proper distance from the lens to the picture in inches.

The matter of accurate focusing is the other point that must be considered. At the short range necessary to fill the camera field with an average snapshot the focusing is very critical. In other words there is very little depth of field. Furthermore, very few cameras are so equipped with standard lens that they may be focused for distances under two feet.

For these short focuses, the most available method is in the use of auxiliary lenses. This procedure is very simple when the principle of these lenses is understood. Quite satisfactory lenses for this purpose are available in the lenses from reading glasses or spectacles, which may be secured at very little cost. These lenses may be held before the camera lens with a filter holder taking a 1½ inch filter. Or they may simply be held before the camera lens by hand, if care is taken to keep them parallel with the camera lens. When used with a focusing camera the regular lens should be set at infinity, except as explained below.

These lenses are usually marked with a small sticker bearing two numbers one over the other. For example, the top number may be +2.50 and the bottom number 16. The top number is the dioptr of the lens and the bottom is the focal length in inches. In using a lens bearing the particular numbers given above it should be held so that the auxiliary lens is as close to the camera lens as is practicable and so that it is between 15 and 17 inches from the picture to be reproduced.

These lenses may be secured readily in the following focal lengths expressed in inches: 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 26, 32, 40, 52, 80 and 144. The range of sharpness for each of these lenses overlaps slightly that of the nearest lens on either side. The dioptr of the lens is found by dividing the number 40 by the focal length, or the focal length may be found by dividing 40 by the dioptr. This principle is useful when it is desired to combine two or more lenses to get a shorter focal length.

To determine the focal length of a lens combination the dioptrs of the two or more lenses making up the combination are added together and the sum divided into the number 40. By use of this lens combination method and with a pair of lenses for each of focal lengths 144, 52 and 16 inches, a combination with any desired focal length can be secured. The only limitation on the number of lenses which may be so combined is the mechanical problem of holding them centered before and parallel with the camera lens. It is obvious that these lenses must be shielded from any strong direct light such as the sun or an electric light used for lighting the subject.

Where a focusing camera lens is used the various focal lengths can be secured by combining the auxiliary lenses and the camera-lens settings as given by the accompanying table.

TABLE OF COMBINATION FOCUSES USING
AUXILIARY LENSES WITH A FOCUSING CAMERA

CAMERA LENS SETTING	FOCAL LENGTH OF AUXILIARY LENSES							
	26"	20"	16"	13"	10"	8"	20"+10"	20"+8"
INF.	26"	20"	16"	13"	10"	8"	6 $\frac{5}{8}$ "	5 $\frac{3}{4}$ "
15'	23"	18"	15"	12"	9 $\frac{1}{2}$ "	7 $\frac{3}{4}$ "	6 $\frac{1}{2}$ "	5 $\frac{5}{8}$ "
10'	22"	17"	14"	11 $\frac{1}{2}$ "	9 $\frac{1}{4}$ "	7 $\frac{1}{2}$ "	6 $\frac{3}{8}$ "	5 $\frac{1}{2}$ "
8'	20 $\frac{1}{2}$ "	16 $\frac{1}{2}$ "	13 $\frac{1}{2}$ "	11 $\frac{1}{4}$ "	9"	7 $\frac{3}{8}$ "	6 $\frac{1}{4}$ "	5 $\frac{3}{8}$ "
6'	19"	15 $\frac{1}{2}$ "	13"	11"	8 $\frac{3}{4}$ "	7 $\frac{3}{16}$ "	6 $\frac{1}{8}$ "	5 $\frac{1}{4}$ "
5'	18"	15"	12 $\frac{1}{2}$ "	10 $\frac{3}{4}$ "	8 $\frac{1}{2}$ "	7"	6"	5 $\frac{3}{16}$ "
4'	17"	14"	12"	10 $\frac{1}{4}$ "	8 $\frac{1}{4}$ "	6 $\frac{7}{8}$ "	5 $\frac{7}{8}$ "	5 $\frac{1}{16}$ "
3' 6"	16"	13 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "	10"	8"	6 $\frac{3}{4}$ "	5 $\frac{3}{4}$ "	5"
3'	15"	13"	11"	9 $\frac{1}{2}$ "	7 $\frac{3}{4}$ "	6 $\frac{1}{2}$ "	5 $\frac{5}{8}$ "	4 $\frac{15}{16}$ "
2' 8"	14 $\frac{1}{2}$ "	12 $\frac{1}{2}$ "	10 $\frac{1}{2}$ "	9 $\frac{1}{4}$ "	7 $\frac{1}{2}$ "	6 $\frac{3}{8}$ "	5 $\frac{1}{2}$ "	4 $\frac{7}{8}$ "
2' 4"	13 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "	10"	9"	7 $\frac{1}{4}$ "	6 $\frac{1}{4}$ "	5 $\frac{3}{8}$ "	4 $\frac{3}{4}$ "
2'	12 $\frac{1}{2}$ "	11"	9 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	7"	6"	5 $\frac{1}{4}$ "	4 $\frac{5}{8}$ "

What to Shoot at Texas Centennial

by
Wm. J. Grace



IF YOU'VE been listening to your radio or reading almost any of the national magazines, you've probably come to the conclusion that something is going on down here in Texas this year of our Lord 1936. Those in charge of Centennial publicity have been about as busy telling the world about the Texas Centennial as the 1933 Chicago World's Fair had written about it.

Because we're the sort of people down here who don't believe in wasting too much effort shouting our advantages and achievements (this is too close to the "Land of Manana" to get too worked up about anything), we haven't impressed the nation very much with anything but our size.

Yet size alone isn't the only thing Texas has to commend it—in fact, that's the least of our proud possessions. What the residents of Texas are most proud of is the history and romance of a commonwealth, a State, and the only State, which was a Nation in name and fact before it became part of our great United States. The land that is Texas has been under more different flags than almost any other territory in the world—Spain, France, Mexico, Texas, Confederate, and United States. Cabeze de Vaca is supposed to have landed on Texas' shores in the year 1519, quite a few years ago; not long after Columbus' discovery of the Continent.

What Texas is celebrating this year is the one hundredth anniversary of its freedom, not its total age. And it is the color of 400 years of human endeavor that makes the background for these last hundred years of settlement and progress.

When one tours thru the Atlantic and films historic spots of "the place where the Pilgrims landed", "where the Civil War was started", "here lies John Brown's body, a molderin' in the grave", one is proud of having captured a movie record of our Nation's early days. But until this year, I'm afraid, we've been overlooking a lot of bets in the historical interest line when we slight the romance of Texas history.

This Summer thousands of visitors will come to Texas to see what we're shouting about down here. More than a few will be surprised, I feel sure, to find that we don't wear cowboy regalia and a pair of sixguns, but you won't be here long until you begin to feel that under our standard modern garb we have retained our old-time long range vision and willingness to pioneer things. The subtle undercurrent of power to progress is by no means entirely masked by our seeming languid locomotion. When we move it's to get somewhere.

If you are fortunate enough to capture this spirit of Texas on your film footage, you've done a thing which lifts your news-reel record out of the commonplace—and I know it can be done, for I've seen movies which prove it without a doubt.

When you come to Texas this Summer, be sure to be all set to cover the whole State. Dallas is having a unique Central Exposition on the site of her regular permanent State Fair Grounds, and impartial visitors have said that while the Texas Centennial Central Exposition at Dallas isn't as large as the Chicago Fair, it is just as impressive and in some ways more beautiful. You see, at least half of the buildings are permanent structures, not just good for this year's Fair.

At Dallas you'll find a collection of buildings modern in design as were those at Chicago, but modified somewhat and lighted differently. The method of lighting the streets is unique with its modern half-shells lighted by concealed floodlights and neon strips, colored fountains, and lighted building walls. There is no direct illumination at all on the grounds—everything is lighted either thru translucent glass panels or by glowing walls lit by concealed rows of lamps. There isn't a great deal of neon lighting, neon being used chiefly for occasional bordering.

Frankly, I haven't tried to film any of the Dallas Exposition at night with Kodachrome, but I am informed by the local Eastman representatives that full exposure can be made with a camera which can be hand-cranked at 2 frames per second. Not that I doubt this man's word, but I believe I can get night shots with sufficient exposure at 8 frames, and I intend to try some of it. Another scheme which could be effectively used is to take movies about 7:45 or 8:00 P.M., when there is a little natural sky light to help out the artificial illumination and give the buildings form. But in the daytime, Texas sun will light the buildings brightly enough so that at 16 frames Kodachrome will require $f/5.6$ to 6.3 in the sun and around $f/4.5$ in the shade (not indoors, however). If you don't plan to use Kodachrome, by all means use panchromatic, for I don't believe you'll be satisfied with the way the myriad of colors will turn out with any other black-and-white film. You can do that with either 16 or 8 now, you know.

But don't let the Dallas show be the only thing that brings you to Texas for movie making. San Antonio has four old missions in various states of ruin, and one cathedral down town which is, of course, in good repair, for it's used for services today. You can climb all over the missions and get any number of angles. And the most famous of all the Texas missions, the Alamo, is right in the heart of town. The Alamo, in case you haven't heard, was

Continued on page 312

If Story Is Not the Thing

What Is?

by
Max Liszt

ONCE UPON A TIME a man in the East exclaimed: "The play is the thing!" And the men in the West, those who make pictures, bowed their heads reverently and chorused in unison: "A-men!"

And ever since have they chased the rainbow with the pot of gold (the play). And ever since have they cried for stories, to make into pictures that would roll in the dollars at the box offices. And ever since have they put the men of the East, those who write and produce plays, on a high pedestal, for was it not one of them that spoke such wise words of the play being the thing? And ever since have they raided New York for plays (stories) and made them into pictures that, nine times out of ten, stayed below expectations or chalked up a loss. And ever since have they pried into the nooks and corners of the world for stories.

Yawsuh! Good stories, because the story is . . . etc.

Naturally, seeing these good men busily prying for good stories, one is inclined to believe that they know what constitutes a good story. Until one asks.

Then the busy men will look up and sum up a list of New York plays that made money at the stage box office, and pronounce these plays good plays—good stories. But they forget to mention that these selfsame plays when poured in film-form many times flopped miserably or stayed below the mark: money-maker.

And when this is called to their attention they shrug their shoulders, mumble something about sticks and hicks, but insist that they were good stories.

One is insistent and demands to know what the ingredients are of a good story. Then the busy men will gulp, stare at one another for a moment, next act as if they did not hear the question, and then busy themselves again searching for stories, good stories. Yawsuh!

In their anxiety, and to cover up, they will resurrect old plays, old stories that were once made into pictures that earned good money, pronounce these, therefore, to be good stories and suggest that the studio re-make them. Because these, the men will argue illogically, are good stories made into box office pictures once before, and therefore they will make money again.

The studio makes this "good story" into a picture again, only to find out, most of the time, that it flops miserably at the box office.

In desperation the studio calls the men on the carpet to learn "what's up?" only to find out that that great game "passing-the-buck" counts many expert players. And so the merry-go-round goes round-and-round and gets nowhere.

What is a good story? What is a bad story?

There are no good stories. There are no bad stories.

Every story is good! Every story is bad!

The story is not the thing, its presentation is the thing. And this presentation is what makes the box office behave good, bad or indifferent.

In motion pictures we are telling a story in filmic motion, and the way this filmic motion is employed determines the picture's (story's) success. It is the same as with a joke. One man will tell a joke and the audience will be bored. Another man will tell the same joke, using exactly the same words, and it is a phenomenal success, his "presentation" of the joke's material makes it a good joke, while the "presentation" of the previous man made the joke a bad one. Still it is the same joke, consequently: the joke is good, the joke is bad.

The same with stories: every story is a good story or a bad story depending entirely upon its presentation in filmic form.

Let us look at the following "story"—and try to classify it.

"An angry man leaves his room, closes the door behind him, walks down the stairs, steps into his car and drives away." Is this a story? Most certainly. It tells something and therefore is a story. Its manner of presentation (telling) in the filmic medium will determine its status.

If we have a conventional longshot of the whole thing its status will be "bad" because it does not convey to the audience anything but the physical movements of the man and disregards entirely the mental side of the story. But if we would break this up into several scenes from various (story-determined) angles, emphasizing the mental state (anger) of the man in addition to his physical movements the story is "good" because now the audience will be able to sense the menace of this man and be kept interested.

In these two presentations we have demonstrated that the story is depending upon its presentation to be good or bad, but the story in itself is neither good nor bad and therefore: the story is not the thing, but its filmic presentation is the thing.

The reason why successful stage plays so often flop in their filmic presentation is due chiefly to the great difference between these two mediums of expression: stage and screen. On the stage the medium of expression is dialogue; but the film's medium of expression is primarily by visualisation and secondarily by speech. The mistake is committed by not taking this in consideration, in other words by trying to conform the filmic presentation to the stage presentation thereby resulting in the picture being presented in a manner prostituting the laws of filmic expression, and henceforth it flops.

In order to be able to present a story properly in its filmic form one must know intimately all the laws of filmic presentation, what they stand for and what they are able to do and how they reach their ultimate goal. And above all one must be able to oversee and visualize them as a complete structure because all filmic laws are so intricately dependent on one another that no one is self-supporting so that it is impossible to give one's attention to one law and disregard the others. On the other hand it is absolutely necessary that not one filmic law be overlooked or carelessly applied because one flaw in the filmic structure of the motion-picture presentation of a story is able to make the structure collapse, in other words make the box-office receipts stay on a low level.

In Hollywood, where the production of pictures is a hit or miss process the one who (mostly by accident) delivers a successful picture is towed to by all the stu-

Continued on page 315



CARL
A.
STAHL

Notes on Nautical Filming

by
Carl A. Stahl
Chief Photographer, U.S.N.

"ART IS NOT WHAT—but how!" Thus says Daniel B. Clark, A.S.C., one of Hollywood's best-known cameramen. Some time ago I had the privilege to meet Mr. Clark at the headquarters of the American Society of Cinematographers, where I had a very interesting chat with him about things photographic. To make every picture taken a work of art is the constant aim of Mr. Clark and every one of his brother-members of the A. S. C.

Fundamental principles of art play a large role in the achievement of outstanding results with the camera. If we think of photography as an art, these two words are really interchangeable in Mr. Clark's sentence that starts this article. Remember always that the excellence of the pictures we produce depends not so much on what pictures we make as it does on how we make them.

Do you want to take a series of the best lessons in photography I know of to study composition, balance, lighting, key, harmony and other details that go to make a good picture? You have this opportunity and it will cost you but a trifle. How? you ask,—and when and where? You can start right now. The "course" will be entertaining as well as instructive. It simply consists of studying the superb photography of the Master Craftsman

of the Camera to be seen on the screens of every motion picture theatre in the nation.

Basically, the rules of good photography are the same in every feature production Hollywood turns out, be it drama, Western, costume, musical or any other type of film. When we sea-going photographers have opportunity to see such a classic of the silver screen as "Shipmates Forever," we realize how artistically nautical scenes can really be photographed. But bear in mind that Sol Polito, A.S.C., who filmed this masterpiece, uses the same technique he employed in "Shipmates Forever" in every picture he has photographed. The only difference is that his artistry was perhaps more apparent to us in this film because the scenes photographed were so much more familiar.

So, from now on, when you go to the movies don't only follow the action portrayed; study the photography as well. And one thing I'd suggest in particular. It is: Watch the shadows. They often tell you more than the highlights will about what makes some scenes appear so striking. If you have the sun shining over one shoulder towards the subject when you start filming, you should get a clear photographic record. But you usually want much more than this—you want an artistic record.

One detail of great importance in taking close-up photographs of individuals often overlooked is the angle from which the picture is taken. When taking close-ups of individuals be sure the camera is not too low if you are using a tripod. To have the camera at about waist level when your film would be what is termed making an "angle shot" in the parlance of the professional. "Angle shots" are quite striking at times, and newsreel cameramen resort to them often to graphically picture certain types of scenes, e.g., inspection and reviews. But when a close-up of an individual is photographed from the waist level instead of the eye level the result is apt to be disappointing. You can see why this is by standing close to anyone, looking them in the face, and then, with your eye always on the subject's face, lowering your head to about where your waist line normally is. Apropos to this type of picture, better results are as a rule obtained by not photographing the shoulders "bows on." Have them on an angle, regardless of the position of the head.

A subject that makes a very pleasing picture is a seascape in silhouette. Very few amateurs apparently attempt this. Perhaps the reason is that the method of making silhouettes seems quite unorthodox to them. It is done by pointing the camera in the general direction where the sun is, instead of away from it. Only, don't get the direct rays of the sun into the lens. The sun should either be obscured by clouds, or out of range of the field the lens covers, or some individual or object should hide the direct rays of light.

Another point often overlooked is the importance of fore- as well as background in many pictures, especially in scenes taken on the beach. I recall an incident in Honolulu. The Saratoga, Lexington and Ranger were all riding to anchor off Waikiki Beach. The lighting was not particularly good. But, as often happens, that detail could not be changed except to come back at another time of day. A number of civilians were taking pictures of these three ships from the sea wall. Taken from that point of view they would only get "long shots," devoid of foreground detail. By going a few hundred yards more they could have photographed the same ships through a grove of trees and secured splendid composition by having branches, etc., in the foreground.

Be your subject Shanghai, Bubbling Well Road, the

Continued on page 312

Do Your Cutting Right in the Camera

by
Walter Blanchard

GUS, MY CINEFILMING NEIGHBOR, was in a dither. The big worry was his vacation filming: how could he camouflage all the summer films he'd planned into the footage his pocketbook allowed—and still get complete pictures?

After we'd discussed the matter pro and con through one of Mrs. Gus' best dinners, it took only a hint to persuade Augustus to put his last season's epic through the projector. While our campaign managers in the living room compared notes on hotels, diets and the price of eggs, we compared the celluloid records of Gus' trips to Hawaii and to the Oregon trout streams with reality and the home-movie ideal. On both counts, the films took an awful beating.

Going to Hawaii, Gus' fondest memories are of lazy, sun-splashed shipboard days; of smiling, nut-brown natives initiating one into the mysteries of poi; of the hula; of Waikiki's surf and surfboard-riders; of uncounted acres of tufty pineapples under cloud-decked skies; of spidery palms silhouetted against a silver sunset sea.

His films somehow managed to miss most of this. On the screen we saw mainly chance-met Ratarians and school teachers, afloat and ashore; sprawly, sand-strewn bathers who might, for all we knew, have been idling at Crystal Lake at home; underexposed shots of Honolulu's busy streets—and a few very random shots of Hawaiians near the hotel.

As for the fishing trip, Gus remembers most clearly one darting, leaping steelhead that fought free of his hook; the almost-as-scrappy one that didn't get away; the feathery whiteness of Mill Creek falls; a mountain snowstorm on the Fourth of July; and of Doc Peters' surprising skill at flipping flapjacks.

But his camera didn't catch any of them. He has a lot of shots of his Waltanian friends "cutting up" at camps and gas stations, and a few scenic shots made when the fish weren't biting—and the light was a few points off, too. Fish? Well, there's an end-of-the-roll flash of Doc Peters holding up a fair sized rainbow trout and another flash (underexposed) of the gang eating something that could be either fish or sausage. Of course, as Gus explains, during the snowstorm there was a swell poker game in Harry's tent, and when they went to Mill Creek they had to scramble down a four hundred foot canyon so steep that a camera, added to the necessary fishing tackle, would have been too much of a load. And when the fish were biting—well, everyone was just too busy fishing to think of pictures!

Just the same, when my friends promise me a movie of Hawaii, I want to see something of Hawaii, and when they promise a reel made on a fishing trip, I'd rather like to see something that tells me how successfully they fished. I've never yet seen a convincing alibi on a home-movie screen—and it must be a lot of work to run a projector and apologize at every scene.

So my advice to Gus was to keep his finger off the camera trigger when he wanted to photograph a scene that would need alibing, and not to shoot any scene that might require an apology. Cutting out these shots before they are made will leave lots of footage for the scenes that really tell your vacation story.

Having saved 90% of his vacation film allowance right there, Gus' next problem was what to do with it. It's all right to say, "use it to film the things you'd remember"—

but it isn't so easy to shoot a memory before you have it to remember!

While the ladies raided the Frigidaire and made sandwiches, we tried to analyze our favorite vacation memories. Most vacations can be described by answering one of two one-word questions: "where?" and "what?" In other words, where did you go? or, what did you do? Nine times out of ten, you can tell which kind of vacation yours will be as soon as you've made up your mind how you're going to spend the time.

If you know that much, you can pretty well determine what your camera ought to look at during the trip.

Suppose it's a "where" vacation. Right away you know that your picture needn't concern itself with people except as they are definitely a part of the "where" of your trip. A shot or two of yourself and the wife, perhaps, as evidence of the fact that you visited Honolulu or Ketchikan or the Yellowstone—but wandering Elks, Shriners, or your wife's bridge partners can be ignored, as they are the same everywhere. On the other hand, close-ups of natives munching poi or riding surfboards, or doing the rain-dance at Taos, are definitely a part of the "where" memories. So, too, are Zuni squaws weaving blankets or baskets, Navajo braves hammering silver bracelets, or even the bearded Sikh policeman directing traffic on the Shanghai Bund. Get them, by all means, together with the pictorial shots of Diamond Head, Old Faithful, and Going-to-the-Sun Lake. They're all part of the "where!"

Contrariwise, if your friends are going to ask you what you did while you were away, let the cinebox tell them. Show the crowd you went with getting ready to go; assembling rods, flies, guns and lures. Show them in characteristic bits of action en route. When you get there, use the camera to show how you lived—Jae trying to shave his bristly beard with cold spring water (and the hairy horror he became before he got back to civilization!)—Doc Peters doing triple-turns with a flapjack—Sam's struggles with a pup-tent. Next, let the camera see the gang actually doing what they came there to do: fishing, hunting, galloping or what have you. And show it thoroughly; maybe it won't be possible to follow one complete session of angling through from selecting the fly to landing the fish—but if you photograph the same man in the same place (or a similar one) going through the various stages, the result on the screen will be the same, even though the various scenes might have been made at different times, and with different fish. By all means show the result, too. Say it's fish: show not only the big beauties the boys boast about, but also the lesser fry. There's always comedy in a disappointed angler measuring a fish that's just a fraction of an inch too small, and reluctantly throwing it back!

Continued on page 316



Selections In Color

by
Wallace Black

THERE'S an enormous difference between merely being able to do a thing, and knowing when to do it. Max Schmeling, for instance, could undoubtedly wallop Joe Louis' profile quite as effectively on a street corner as in a canvas-floored ring—but doing it in one place would simply get him arrested, while in the other, the same action will get him a very sizeable percentage of a million dollars.

It may be far-fetched to compare natural-color cinematography with the manly art of assault and battery, but they have this in common: each can be good or bad according to when and where they are practiced. Technically, it is possible to put a roll of Kodachrome into any substandard camera and photograph anything and everything in full color. Actually, misused color scenes can show as much bad judgment as fisticuffs in church.

A year ago, when Kodachrome appeared (and seven years ago, when Kodacolor made its bow), the first impulse you and I and everybody else had was to make a bee-line for the nearest garden and expose hundreds of feet of useful film close-upping the posies. So what? We proved that the film would give us a very pleasing reproduction of

the shape and color of the flowers. And we learned almost as quickly that our most gorgeous colorfilming efforts were of no particular interest to audiences.

At that point, nine out of ten of us started jumping to conclusions. Our finest color photography failed to interest audiences—the same audiences, perhaps, who liked our black-and-white. Ergo, color movies did not interest audiences. And nine out of ten of us went cheerfully back to black-and-white.

And here and there the tenth cinefilmer reasoned differently. The color might be good, but was the film interesting as a picture?

Looking at things this way, it isn't hard to see why so many home colorfilms landed on the shelf. All the thought had been devoted to making the color itself good, and little or none was left to give intelligence to what the picture was to say. Inevitably, audiences paid them the usual tribute accorded "dumb Doras": a moment's applause for their beauty, followed by huge quantities of indifference to their inarticulate maunderings.

Once the situation has been reasoned out this far, only one conclusion can be reached: that a color picture, if made with the same attention to audience-appeal that would be exercised making the same film in black-and-white, ought to prove more interesting because of the addition of color. Provided, always, that the color does not of itself divert the audience's attention from whatever the picture was trying to tell.

Until the time comes when we can all shoot color exclusively, and the film manufacturers stop making black-and-white film, the best way to insure that color won't be fighting audience-appeal is to select for our color-films subjects which are definitely helped by color. To be filmically worthwhile, color must be a genuine part of the scene—not merely an embellishment. In general, if your picture concerns itself primarily with a place or thing shown, color is a pretty safe bet. On the other hand, when the picture deals primarily with something done, black-and-white is usually as good or better.

One of the most discerning of filmsters in this connection is that perennial competitor in the American Cinematographer's Contests, H. W. Voss, of Florida and points west. Mr. Voss' favorite shooting-ground is the "Wild West" of Yellowstone Park, the Jackson Hole country and the Grand Tetons. Time and again, as Contest-time drew near, the Editors would learn that that gentleman was submitting two entries, the product of his summer's filming. One reel would be in black-and-white; the other in color. Each one would deal with a different type of subject. Each subject would prove ideally suited to the medium chosen for its presentation.

The black-and-white entry usually dealt with some phase of the activities of the old West. Cattle-ranching—horse-raising—rodeos: every one an action-story.

The color entry would deal with the country itself. "Wonderful Wyoming"—"The Rivers and Geysers of the Yellowstone": subjects in which color itself told half the story.

In the monochrome productions, action was the keynote. At a real rodeo, the display of color is interesting, but only incidental to the action we've paid to see. We may remark, "That's a beautiful bay horse", or, "That fellow in the purple shirt certainly can ride"; but a minute later, the rider rockets through the dust, and we've quite forgotten whether his shirt is purple or black. On the screen, we're interested in whether horse or man is going to win the battle: what they do—not how they look.

In Voss' color films, colorful scenic beauty was the story

Continued on page 314



enters from camera and takes chair at extreme left. They gaze expectantly at the piano.

SCENE 5: LONG SHOT from guests' point of view of Daughter at the piano. She adjusts the position of the piano bench and fingers a music sheet.

SCENE 6: MEDIUM SHOT of Daughter as she strikes the opening notes of her concerto.

SCENE 7: CLOSE SHOT. Daughter's hands as they finger the keys.

SCENE 8: LONG SHOT from the piano of the guests, listening.

SCENE 9: MEDIUM SHOT of the guests in rapt attention, PANNING from right to left, and holding the shot on Mother's happy face.

SCENE 10: CLOSE-UP. Mother's face beaming proudly at Daughter's accomplishments. DISSOLVE TO—

SCENE 11: CLOSE-UP. Mother in different dress, looking proudly down.

SCENES 12 TO 15: Cut in some old scenes of Daughter, first as a tiny baby and at successive stages of growth.

SCENE 16: CLOSE-UP of Mother's face. (Continuation of Scene 11.) DISSOLVE TO—

All of the Family is in This Scenario

PICTURES in good continuity based on incidents in family life serve a double purpose. You have a human-interest item of entertainment for any audience and, more, have a documentary film on direct concern to your own household. Here is a story in scenario form, easy to shoot and with your immediate family or friends as the subjects of your photography.

The dissolves lift the film from the elementary amateur production as do the impressionistic scenes incorporated between them. Sooner or later, every advanced amateur filmer has ambitions of making a symbolistic reel depicting the inner meaning of real events in subjective form. This one reveals the private thoughts of the listeners to a piano solo and is purposely in a light vein. Try it on your camera:

MAIN TITLE: MUSIC HATH CHARMS.

SCENE 1: CLOSE-UP of the keyboard of your piano from a high camera angle, the keyboard extending diagonally across the screen.

SCENE 2: MEDIUM SHOT from a similar camera angle of the piano. Mother leads Daughter by the hand to the piano bench.

SCENE 3: MEDIUM SHOT from a low set-up. Daughter is guided by Mother to a sitting position on the bench, her hands rise to the keys. Mother turns her head away from the piano and speaks a few words to those in the room.

SCENE 4: LONG SHOT from Mother's point of view of the room's occupants. Seated informally on chairs and davenport are Uncle, Aunt, Sister, Brother and Father. On the floor sits the family dog. A typical domestic living-room scene. All are looking toward the piano. Mother

by
Barry Staley

SCENE 17: CLOSE-UP of Mother. (Continuation of Scene 10.)

SCENE 18: CLOSE-UP of Uncle. Possibly he may hide a faint yawn behind cupped fingers and his eyes droop slightly. DISSOLVE TO—

SCENE 19: LONG SHOT, full figure, of Uncle in comfortable sports clothes driving from the tee of his golf club. He wallops the ball mightily and proceeds down the fairway, away from the camera.

SCENE 20: LONG SHOT. A pictorial stretch of the fairway. Uncle strides in from camera and down the fairway towards the green.

SCENE 21: MEDIUM SHOT. On green. Cup is prominent in composition. Golf ball bounces in from camera, rolls along green, drops in the cup.

SCENE 22: LONG SHOT. Same angle as Scene 21.

Continued on page 314



WHEELS OF INDUSTRY

In Error

● Fotoshop, Inc., find that an erroneous statement appeared in their display advertisement in the June, 1936, edition of *American Cinematographer*. The price of Fotoshop Rapid Panchromatic 16mm Film in 10-foot rolls was given as \$3.75 per roll, two rolls for \$5.50. The price per single roll is correct but the price for two rolls on one order is \$7.00—not \$5.50 as stated.

16mm Catalog

● Bell & Howell Company announces a new edition of its catalog of Sources of 16mm Films on Geography, Travel, and Natural Resources. The purpose of the catalog is to indicate as completely as possible the films available in this field and where they may be obtained by free loan, purchase, or rental.

Especially noteworthy is the large number of sound films listed—87 in all. Among them are several of feature length, such "Thunder Over Mexico", "Isle of Peril" (life on the Faroe Islands), "Matto Grosso" (River of Doubt Country in South America), "N'Mango" (British Cameroons), "Trekking to Timbuctoo", and "This is America".

Also listed are timely sound film shorts, such as "Ethiopia" and "The Winter Olympic Games in Germany", several sound films on travel in Germany, three on coal mining, as well as a number on tractors and oil.

The National Park Service now has a full dozen films on National Parks, CCC and ECW work.

Among new silent films is a fine listing of hunting and fishing subjects available through Field & Stream magazine and the South Bend Bait Company. There are, too, films available on the construction of Boulder Dam.

A Kodachrome silent film on Bermuda is listed as available from the Cunard White Star Limited.

The catalog may be obtained from Films Division, Bell & Howell Company, 1801 Larchmont Avenue, Chicago, by sending 25 cents in stamps to help defray the cost of preparation and mailing.

SOS Catalog

● A ninety-page catalog of Cinema Equipment and Supplies for Theatre and Allied Fields has been issued by Sales-On-Sound Corporation, New York City. This catalog brings practically every conceivable type of sound equipment, supplies and accessories for any part of any theatre.

The preface lists such classifications as: Amplifiers, Sound-heads, Projectors, Sound Systems, Portables, Lamp-houses, 16mm Equipment, Booth Equipment, Public Address, Studio and Laboratory Equipment, Sound Screens, Lenses and Reflectors, Opera Chairs, Supplies for Stage and Auditorium, Current Supply Devices, and Air Conditioning. A considerable number of these items are manufactured products of S.O.S., offered direct to theatres at decided economies.

Kodachrome Titles

● Bell & Howell Company announces Titlecraft color titles for Kodachrome film in both 16mm and 8mm.

These color titles are said to be brilliant, clear, and readable, and are available in four different tones: Blue, with purple and pink overtones, pale pink letters; dark green, with gold overtones, pale gold letters; brown, with orange overtones, yellow letters; brown, with green overtones, pale green letters. Color tones may be ordered to fit the character and mood of the sequence into which the titles are to be spliced.

The lettering may be had in standard type or junior letter styles on any background shown in the Titlecraft sample book, copies of which are available at Bell & Howell dealers.

Tripod Screen

● This model is now available in three sizes, 30x40", 36x48" and 42x56". It is said to be durable, compact, conveniently portable, beautifully finished, rigid in use and simple in operation. It can be raised to a height of 7½ feet from the floor. Operation is simple and accomplished after an improved manner. There are no thumb-screws to manipulate—as all adjustments are readily effected by means of spring re-

lease catches enabling one to set the screen at a desired height with instantaneous ease. Its various features include solid steel legs, doubly reinforced bronzed machined bushings which holds the legs firmly in place and brackets extending from the spring tube which support the screen. The tube is pivoted onto the tripod in a manner that will enable it to withstand consistent usage. Legs and roller tube are finished in black crackle, the tripod tube is nickel plated, the cloth beaded in conformity with the quality of other Britelite-Truvison Screens. A solid leather handle attached to the tube facilitates ease in carrying.

8mm Slitter

● J. C. Haile & Sons of Cincinnati announce a slitter for 8mm film. This is sold to assist those who use the double 8mm for titles and do their own processing. In addition to this this company also markets an 8mm film of the positive type for reversing. It is sold with or without processing privileges and in either 25 foot or 100 foot lengths.

Movie University

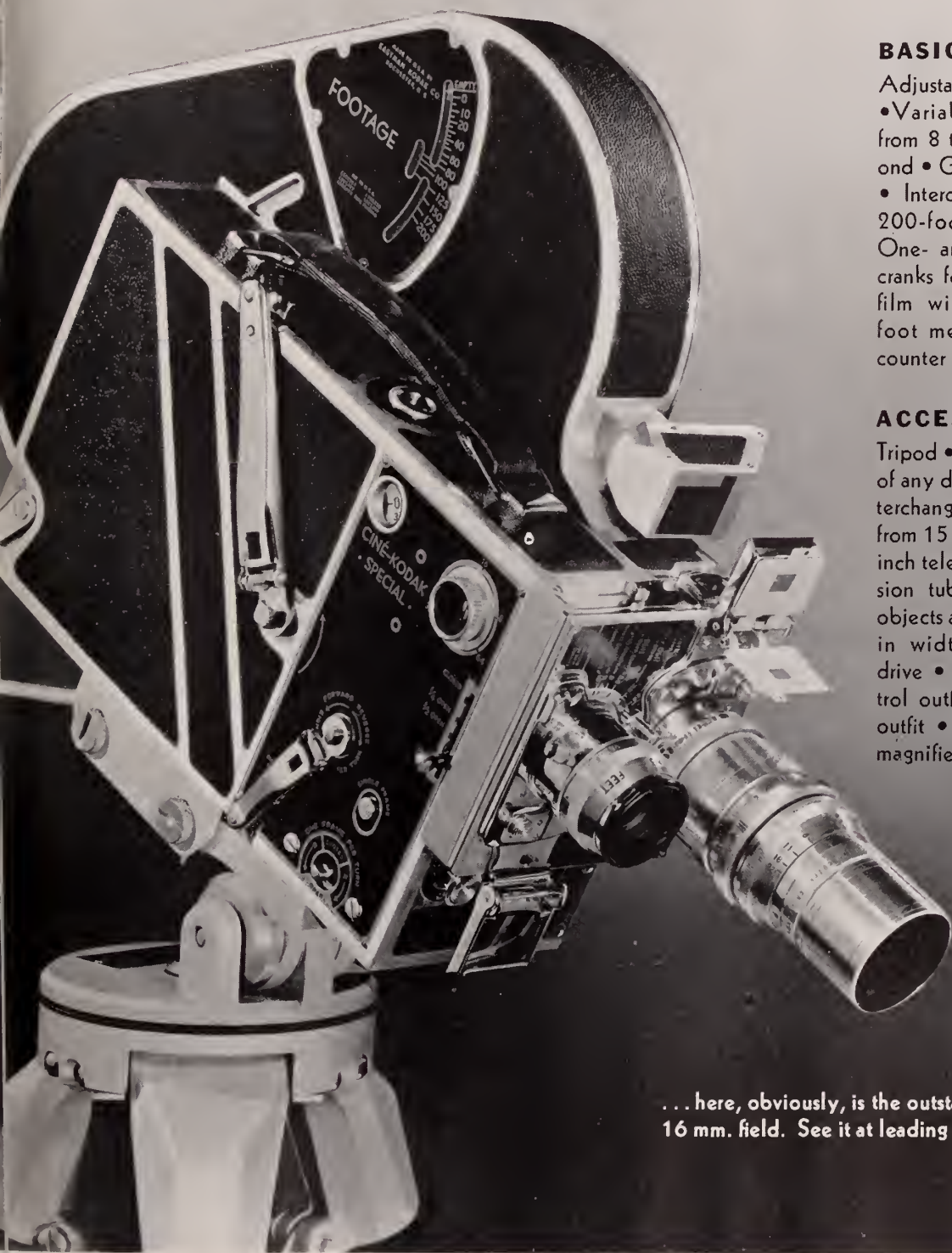
● A traveling university, the largest educational institution in the world, with an enrolled student body of more than 20 million, is predicted within the next few years, by George J. Zehrung, Director of the Motion Picture Bureau of the Y.M.C.A. Courses, taught entirely or supplemented by educational films, will go regularly, at a very nominal expense to groups of students, no matter whether they live in one of the great cities, or the wildest mountain ridge or the western plains. It is conceivable that every course now given at any university, from archaeology to medicine, can be included in the new university's curriculum, Mr. Zehrung declares.

Filter Holder

● Harrison & Harrison announce an improvement in the adapter for their filter holder which links this accessory to the tripod and camera. The new unit permits changing the angle of the holder at any time. The rod and holder are never rigid under the new plan of fastening.

UNDISPUTED LEADER OF THE 16 MM. FIELD

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BASIC FEATURES

Adjustable opening shutter

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- Ground glass focusing
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Tripod • Tripod truck • Masks of any desired design • Six interchangeable lenses ranging from 15 mm. wide angle to 6-inch telephoto • Lens extension tube outfit for filming objects as small as .047 inches in width • Electric motor drive • Electric release control outfit • Remote control outfit • Reflex finder image magnifier

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A small hand machine of extreme accuracy. Hardened and ground steel cutting wheels—operation very simple, just draw film thru to slit to exact 8mm width. Includes high contrast developer formula for titles. Price \$4.50 postpaid if your local dealer does not carry in stock.

Positive film for titles, 16mm double perforated for use in double 8mm cameras, \$1.00 per 25-foot roll. Includes later free development and return. Same film, no development, 55¢ per roll. Postpaid Ohio orders add 3% sales tax.

J. C. HAILE & SONS
Motion Picture Department
215 Walnut St. Cincinnati, Ohio

HERE'S HOW

By A.S.C. Members

In the July, 1935 issue of American Cinematographer, on pages 306 and 316 there is an article on "Home Reversal Development of Movie Film." I would like to have a little information on the part appearing on page 316 covering "Printing Method."

1. *You state there that only same exposure is needed when using positive as is used when using pan film. I do not find this true unless there's something I do wrong because I get a very dark picture as though under-exposed. Should not one or two stops more be used when using regular positive stock?*

2. *Also in event of under-exposed film, what one of the processes will take care of this? On an under-exposure should the films be left in the first development longer or shorter, or should it be kept under the flashing light longer or shorter, or should the last development time be varied?*

3. *Also as to the D-76 Developer, should this be used full strength on the first development and for how long?*

4. *I also find that the emulsion side of the film has a sort of brownish cast to it when completed. Is this caused by the acid-stop-bath or what? And how can it be eliminated?*

—R. J. Daugherty.

In your question No. 1 you say that our article states that some exposure can be used on positive as is used for pan film. If you will read further, you will notice that it says "when you have blue light." This, of course, is true because the basic sensitivity of all film is in the blue. In other words, the silver grains are sensitive to blue only and all film must have the silver in the emulsion, so if you used pan film and had only blue light it would not be any faster under those conditions than positive film. If you have any shadows in your picture it is natural that positive film will go very dark as there is very little blue light in shadows. Also if you have a green background, the green will go dark. Shoot positive film about two stops wider open than pan.

Question No. 2: When your film is under-exposed it is better to carry it a little further in the first development.

Your greatest control is in the first development.

Question No. 3: Use the D-76 Developer full strength in the first development. The length of time is going to be controlled by the exposure you gave the film in your camera as explained in the answer to your question No. 2.

Question No. 4: The reason you are getting a brownish cast on your emulsion side is that you do not wash the film long enough after taking it out of your acid-stop-bath. Each washing operation should be not less than five minutes in water that is flowing vigorously.

—A.S.C.

During the past several years I have printed 16mm pictures for a very good customer of this laboratory. I have used Dupont 16mm positive film for these prints.

Sometime ago this customer notified me that my prints wouldn't feed well through their R.C.A. sound projectors. An investigation showed that the developed film was of much different size than undeveloped material, due to expansion during development and shrinking during the drying process.

The next order was handled with great care, especially in the removing of excess water from the film previous to drying, and during the drying time. I projected every one of the prints in my Filmo projector and they went through all right, but again the customer complained that the prints gave them trouble in the projector.

I tried a Chrome alum stop bath recommended by Dupont, but it did not seem to remedy the condition according to the report from my customer.

I have exhausted all experimentation possibilities; can you suggest any remedy for me.

—A. Manrique.

It would not be fair to say that any one brand of safety film will stretch or shrink more than another. According to reports we have received from reliable laboratories making 16mm positive prints it would seem that it is reasonable to expect the film to stretch to such an extent that the distance between perforations is .304". As you know the distance between the sprocket holes in 16mm film is .300". We have heard of

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this film shrinking to .292" between sprocket holes.

It is the contention that the pull down claw on projectors should have a stroke to make contact with the sprocket when the stretch has a maximum of .304" between sprockets. If it is less than this, the claw will naturally ride on the film until it contacts the hole and then pull the film down.

You might check the particular projector to determine the pull down stroke. It may be out of adjustment. Also if it is the type that has a double claw it may be possible that one claw contacts the hole and the other claw rides on the film. This would create a pressure in the gate.

There is very little we can do about the stretching and shrinking of acetate film. We must have safety film for use in commercial and home work and therefore the manufacturers of projectors endeavor to build in a "factor of tolerance" so as to take care of this condition.

Notes on Nautical Filming

Continued from page 304

ruins of Old Panama, or the skyline of New York, study the scene to determine the best method available to get the finest results possible under the prevailing circumstances. When taking "long shots," always give consideration to improvement which addition of suitable foreground might make. If your friends or shipmates constitute the foreground, having them look at the point of interest you are photographing and not at the camera, will usually give a better composition from a pictorial standpoint.

Outstanding photographs are made by looking after every detail, no matter how trifling. It is appropriate to recall the words of Michael Angelo, "Trifles make perfection—and perfection is no trifle." Make this motto of the Old Master your guiding star and watch how the quality of your movies improves.

What to Shoot at Texas Centennial

Continued from page 302

the cause of the beginning of the end of Texas' fight for her independence from Mexico.

While you're in San Antonio, a city which its Chamber of Commerce has named the "Winter Playground of America", you will delight in the Mexican quarters, the street vendors of pralines, the peculiar intermingling of the bustle of Northerners and the sleepy indifference of the Mexicans. And trees—lovely, spreading, heavy shade trees and moss.

Houston, the largest city of Texas, both numerically and in point of land

covered, is famous for two things for the filmer. First, historically, is the San Jacinto Battleground, twenty miles down the ship channel from Houston. It was on this historic spot that the wounded Houston won Texas' independence, and the place fairly reeks with the ghosts of the brave men who won our independence.

About fifteen years ago business men of Houston, aided by Federal grants, built the Houston ship channel. It was built to allow the biggest ocean-going vessels to come some 50 miles inland, and in '28 and '29 I've seen tankers, freighters, and passenger vessels forming a veritable parade up and down the channel. At places, for instance at Morgan's Point, the boats look as if they were sliding on the land, for the channel is a bit narrower there.

Houston is more like Los Angeles than any other place I've seen. It's clean, has wide streets, and goes in for tricky hotte dogge shoppes and fine cars. And it has the most modern busses in the country.

At Houston also is one of the most beautiful universities in America. I might be a bit prejudiced because it is my alma mater, but if you see Rice Institute while you're in Houston, you are in for a beautiful sight. Not only are the buildings beautiful, but the year-round moisture in that climate makes it possible for the gardener to make a flower paradise.

Yes, if you are looking for something

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new to film, you can't go wrong if you tour Texas this year. From the endless plains of West Texas to the Piny Woods of East Texas, and from the high cattle country of the Panhandle to the invitingly cool Gulf, Texas is yours to enjoy. And to enjoy reliving thru your movies. If this article seems to smack too strong-

ly of local Chambers of Commerce, please pardon it. But honestly, you'll love the filming opportunities Texas offers you especially this year. Take it from one who is not native born, yet who loves the Big State, you simply must fill your film album with myriads of colorful shots of the Southwest.

SELECTIONS IN COLOR

Continued from page 306

told. Nothing much happened; people appeared now and then, but what they did was of no consequence. Where they were, what they saw, was everything. The delicate pastel-tinted creams, buffs and blues of the fumaroles—the amazing reds, purples and whites of Zion Canyon—the rainbows flickering in "Old Faithful's" snowy white spray—the unbelievable blue of Crater Lake: the story there was color, and it had to be told on the screen with color.

Not all of us, though, can start a vacation planning to bring back two or more separate productions. If we shoot any color, it must be used as part of a black-and-white picture. Esthetically, this may be all wrong, but budgets usually overrule esthetics, even in professional filming. With the proper selection of subjects, and intelligent editing and titles, color can be used very successfully to add a "punch" of eye-appeal to important parts of a picture.

The first thing, of course, is to plan the camera's itinerary so that the color-shots can be grouped into definite sequences, each of which climaxes a certain part of the story. Best of all, hold the color for the climaxing sequence of the picture, if you can. And plan your continuity so that the transitions from black-and-white to color won't be too startlingly abrupt.

An excellent recent example of this type of picture was "Southwestern Wonderlands," photographed by John F. Criswell. The "story" of this picture was a tour of the National Parks in the Southwest—Zion Canyon, Bryce Canyon, Cedar Breaks and the Grand Canyon. About a quarter of the film's four hundred feet was in Kodachrome. In each case, the color marked the climax of that particular part of the picture. The "story" would be developed as far as possible in black-and-white, and then a title would hint at the glorious display of color in that region—and Kodachrome would take up the thread of the story until a definite change of thought led to the next episode. In every instance, the descriptive titles were made on cards decorated with simple pen-and-ink sketches of the scene which was to be shown thereafter. In some instances, the last black-and-white scene of a sequence would be either a duplicate of the succeeding color-shot, or of a very

similar scene. Thus the audience was prepared for the color when it came; color was something expected—something necessary, rather than an abrupt surprise.

In any color-filming, there are certain basic rules to the game. Experienced black-and-white filmers have learned, for instance, that a person near the camera will dominate one farther away; that a person in the sunlight will dominate one beside him, but in the shade; that a person clad in white will attract attention from one clad in gray or black clothes.

Much the same sort of thing applies in color-filming, too. A bright color

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will almost always dominate a soft or neutral-colored object. Certain colors—especially reds and blues—are particular "scene-stealers". In black-and-white, a moving object will almost always draw your attention from one that is motionless: but in a color scene, a strangely red or blue object, whether or not it moves, will pull your eyes away from a far larger moving object or person. One of my earlier color-scenes is a medium-shot of a very pretty girl under a tree; composition and lighting favor the girl's face, but there is a patch of sky showing through the tree which shows up unexpectedly blue in the distance—and though I've run the scene a hundred times, I can never keep my eyes from rushing unbidden to be irritated by that unnatural bit of sky!

The softer color-renderings are therefore vastly preferable in a color-film. It is nice, of course, if you can get these by selecting the right subjects; but if you can't, the camera can often help you. Underexposure tends (up to a certain point) to brighten colors; overexposure tends to soften them. So if you want soft tones in your picture, deliberately overexpose a bit. A degree slower on your meter's film-speed setting will generally suffice.

Another useful trick is to take advantage of the narrower latitude of color emulsions. There is far less range between correct exposure and dead-black underexposure than in black-and-white, so by keeping unwanted strong colors in the heavy shadows, you can virtually eliminate them.

ALL THE FAMILY IS IN THIS SCENARIO

Continued from page 307

The unoccupied green. Uncle strides in from camera, stops, searches the scene for ball. Then, unbelieving, walks to cup and peers in.

SCENE 23: CLOSE SHOT. Uncle discovers the miracle. A hale-in-one! With hand lifts ball from cup.

SCENE 24: MEDIUM SHOT. Uncle doing a wild Indian dance on the green in celebration of every golfer's ambition materialized. DISSOLVE TO—

SCENE 25: CLOSE-UP. Uncle. (Continuation of Scene 18.) A ghost of a smile comes to his face. A far-away gleam to his eyes.

SCENE 26: CLOSE-UP. Aunt's face in listening pose. DISSOLVE TO—

SCENE 27: MEDIUM SHOT of bridge foursome at table. Aunt is facing the camera.

SCENE 28: CLOSE SHOT from same direction but higher camera angle, shooting down. On the table before Aunt, in neat stacks, are twelve tricks. One card remains in her hand. She plays it to the table. Three other cards flutter down. Aunt gathers in the trick. Her hand counts and we see the seven add tricks—a grand slam.

SCENE 29: CLOSE-UP. Aunt's smiling triumphant face. DISSOLVE TO—

SCENE 30: CLOSE-UP. Aunt. (Continuation of Scene 26.)

SCENE 31: CLOSE-UP. Sister's face. DISSOLVE TO—

SCENE 32: MEDIUM SHOT. Exterior of motion picture theater. The program is placarded, or a flaming poster is visible. Sister enters and studies it, moves to right.

SCENE 33: MEDIUM SHOT. Cashier's booth at movie theater. Sister en-

ters from left to window, buys a ticket, exits to theater entrance. DISSOLVE TO—

SCENE 34: CLOSE-UP of Sister. (Continuation of Scene 31.) A longing, wistful expression comes over her face.

SCENE 35: CLOSE-UP of Brother's face, absently staring at piano. DISSOLVE TO—

SCENE 36: LONG SHOT at baseball or football field, or Brother diving into a swimming pool, or other favorite pastime. DISSOLVE TO—

SCENE 37: CLOSE-UP. Brother. (Continuation of Scene 35.) He fidgets restlessly.

SCENE 38: CLOSE-UP. Father's face. DISSOLVE TO—

SCENE 39: CLOSE SHOT. Father seated at desk or table. Before him are collection of monthly bills and an open checkbook holding one check which he is signing. He tears it from book, places it with one of the bills.

SCENE 40: CLOSE-UP. Open checkbook on desk. Father's hands take it up, open it to last stub. On this stub we can read (use an INSERT if necessary) the inscription: Balance, \$0.13.

SCENE 41: CLOSE-UP of Father's worried face, at the desk. DISSOLVE TO—

SCENE 42: CLOSE-UP of Father's face. (Continuation of Scene 38.)

SCENE 43: CLOSE-UP of family dog. Sitting, looking into camera at his level. DISSOLVE TO

SCENE 44: CLOSE SHOT of dog in yard gnawing an huge bone. DISSOLVE TO—

SCENE 45: CLOSE-UP of dog's head. Possibly you can get him to lick his chops. (Continuation of Scene 43.)

SCENE 46: CLOSE-UP of Daughter's hands fingering the piano keys. (Continuation of Scene 7.) With an impressive gesture, they reach the conclusion of the concert and lift above the keyboard.

SCENE 47: MEDIUM SHOT. Daughter has finished her performance. She turns and rises from the piano bench, leaves it.

SCENE 48: LONG SHOT of the guests. (Continuation of Scene 8.) Mather's face wreathes in smiles, she applauds vigorously. Abruptly, as though brought face to face with sudden reality, the other listeners snap into set smiles and polite handclapping.

SCENE 49: MEDIUM SHOT, as in Scene 9, PANNING from left to right and catching the many expressions, to the DOG.

SCENE 50: CLOSE-UP. Dag's head. He is barking enthusiastically. FADE OUT.

Here you have a different type of film, covering quite a range of visual activity, with a bit of Eugene O'Neill flavor. The dissolves show what each person is thinking under the piano's spell. It comes well within the impressionistic category, yet is good fun. Give more rehearsal than usual to your characters so as to get just the right expressions in your close-ups.

If Story is Not the Thing,
What Is?

Continued from page 303

dios. This man, still bewildered and astonished by it all, takes it all in and is quick to take advantage of it, only to turn out a list of flaps, then to hit it again by accident. This because very few men are able to oversee the filmic structure and possess a complete and intimate knowledge of the filmic laws and how to apply them.

Making pictures is not a hit or miss process, as Hollywood is prone to make one believe, and the sooner this is realized the sooner will it be able for Hollywood to raise the percentage of successful pictures.

But it is impossible, as yet, for Hollywood to discard the hit-or-miss process of picture production because it disregards entirely the ultimate aim and appeal of pictures and does not possess the ability to correctly analyze this aim and appeal due to its preference to staring itself blind on the superficialities of the picture-production process.

In my following article entitled, "The Film is Not the Thing," I shall analyze and describe the ultimate aim of pictures.

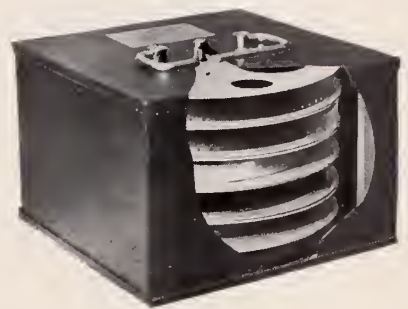


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Do Your Cutting Right in the Camera

Continued from page 305

Close-ups of the speckled beauties sizing in the pan, with hungry-mouthed fishermen lurking around in close-ups add to the completeness of your filmic answer, while for a fadeout, a close shot of the fish being eaten is streets ahead of the conventional sunset.

Eliminating the alibis for subject-matter, there is still quite a bit of room for waste film in the shots that are NG'd for bad photography or useless action. These things can't always be avoided, even by the best of us; but the possibility of their happening can certainly be reduced.

In these days of fast lenses and accurate exposure-meters, errors in exposure should be close to the vanishing point. If experience hasn't made correct exposure almost second nature, by all means use a meter. The less thought you have to give to the mechanics of running the camera, the more will be left for selecting truly telling action. That goes for filtering, lighting and the rest of the technicalities, too.

Camera-movement is a chapter unto itself. Most vacation-films are injured by careless panning and tilting. There should be a legitimate reason for every move of the camera. Generally speaking, if you have to move your head to take in the full meaning of the scene as you see it, the camera should pan or tilt in filming the scene; if you see the really important part of the scene without moving your head, the camera had better be held stationary. When you do move the camera, make sure that the beginning and end of the move are dictated by more than mere happenstance. And remember—always pan slower than what you think is too slow. It'll still be too fast on the screen, for even with a normal lens, the camera looks at a scene as through a field glass!

As for camera angles, if your vacation film is of the "where" variety, stick to the longer shots. If it is of the "what" type, only the closer, more intimate shots can fully reveal the "what."

The human factor—the folks you photograph—can often waste a lot of film if you don't plan otherwise. Very few of us, especially the sort of folks that go places with cinemateurs, are intentionally ridiculous in front of a camera. The silly capers most vacation subjects cut can almost always be traced to the fact that the victim is embarrassed, and doesn't know what to do with himself. Given something definite and natural to do, even the clumsiest half-wit can act reasonably human.

Gus is on his vacation now. If he remembers that his vacation movies

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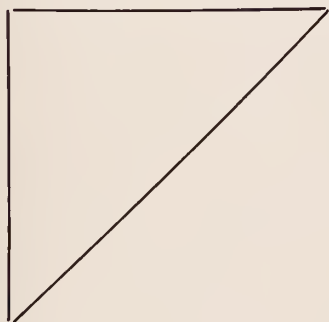
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must restrict themselves to saying "where" or "what," giving his people something definite to do, and using ordinary commonsense in the mechanics of movie-making, he can literally edit his film as he shoots it, cutting out the

mistakes and apologies before they reach celluloid. I think his friends are going to get a lot more pleasure out of seeing his films when he gets back—and I know he'll be happier showing good, purposeful pictures.

AMATEUR MOVIE CONTEST FOR 1936...



The AMERICAN CINEMATOGRAPHER 1936 Amateur Competition is open to amateurs all over the world who use either 8mm or 16mm film.

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